Telephony.

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Another Advance for Service Association.

The Central States Telephone Service Association brought about another big advance in its program of aiding the smaller companies of the central states to improve their toll operating conditions, when it decided this week to put a representative in the field. Frank L. Eldridge, assistant secretary of the association, who will cover this most important branch of the service, is thoroughly familiar with every detail of the work.

Managers of telephone companies who desire assistance of any kind in respect to engineering, traffic or commercial problems, and who have not been made aware of what the Service association proposes to do, will find it to their advantage to communicate promptly with Mr. Eldridge. He will canvass with them these and any other questions relative to toll operation for which they desire solutions.

This move makes for increased efficiency for the new organization and will undoubtedly go further at this time than any other one thing could go to make its scope all-embracing in the field which it has marked out.

Qualifications for Convention Voting.

There appearing to be some uncertainty in the field regarding the matter of voting at the forthcoming convention of the National Independent Telephone Association, TELEPHONY believes it advisable to print the gist of those clauses in the by-laws which affect this important point. The by-laws provide as follows:

FIRST.—That any company engaged in the operation of an Independently owned and managed telephone company may become a member by signing the application blank (a payment of $10 to accompany the application), when the application has been approved by a majority of the board of directors. This entitles the company to one vote.

SECOND.—Every member company may have as many representatives as it shall, **Ten Days Before the Annual Convention,** have paid annual dues of $10 for. The whole number of representative of any company, however, shall not exceed one for 1,000 units (a unit is one operating telephone or one circuit mile of toll line).

THIRD.—On or before the second day of the convention, the president or the secretary of the member company must certify to the secretary of the association the name of the company, the number of units operated by it, and the names of the persons authorized to cast the vote of the company, but no person who is not a bona fide employe, officer or stockholder of such company shall be authorized to cast the vote thereof.

FOURTH.—The voting is confined to representatives present. This provision was made by the committee on by-laws to encourage attendance at the convention, it being thought that every company could induce an officer, employe or stockholder to be present as its representative. This provision could doubtless be changed in special instances by resolution adopted by the convention as is customary in deliberative assemblies.

It is desirable that every company be advised fully in this matter in order that there may be no misunderstanding at the time of casting ballots.

Dry Cells and Their Care.

From time to time articles have been published regarding dry cells, their manufacture, methods of testing and use, but very little has been written of their care during storage and while in service. The user of dry cells often may increase their efficiency by proper care before and after installation. The places in which dry cells are stored in many cases are unsuitable, and the deterioration of the cell is greater than necessary. The deterioration of cells stored in a cool, dry place, away from sun and moisture is much less than on cells placed where they are more or less subject to the last conditions.

The manner of placing cells in the battery box, or container, and the method of connection, has an effect upon their life. Carelessness in placing or connecting the cells often results in their being short-circuited and thus rendered useless. The temperature and conditions of installation are important factors, as is also the size of the battery used for various kinds of service. These and other conditions which affect the ultimate service life of dry cells are discussed elsewhere in this issue by W. B. Pritz. A study of the points brought out and an inspection of dry cells in storage and in use by exchange managers may result in an increase in dry battery efficiency in the plant.

The Dreamers

By HERBERT KAUFMAN

They are the architects of greatness. Their vision lies within their souls. They never see the mirages of Fact, but peer beyond the veils and mists of doubt and pierce the walls of unborn Time.

The World has accoladed them with jeer and sneer and gibe, for worlds are made of little men who take but never give—who share but never spare—who cheer a grudge and grudge a cheer.

Wherefore, the paths of progress have been sobs of blood dropped from their broken hearts.

Makers of empire, they have fought for bigger things than crowns and higher seats than thrones. Fanfare and pageant and the right to rule or will to love are not the fires which wrought their resolution into steel. Grief only streaks their hair with silver, but has never grayed their hopes.

They are the Argonauts, the seekers of the priceless fleece—the Truth.

Through all the ages they have heard the voice of Destiny call to them from the unknown vasts. They dare uncharted seas, for they are makers of the charts. With only cloth of courage at their masts and with no compass save their dreams, they sail away undaunted for the far, blind shores.

Their brains have wrought all human miracles. In lace of stone their spires stab the Old World's skies and with their golden crosses kiss the sun.

The belted wheel, the trail of steel, the churning screw, are shuttles in the loom on which they weave their magic tapestries.

A flash out in the night leaps leagues of snarling seas and cries to shore for help, which, but for one man's dream, would never come.

Their tunnels plow the river bed and chain the islands to the Motherland.

Their wings of canvas beat the air and add the highways of the eagle to the human paths.

A God-hewn voice swells from a disk of glue and wells out through a throat of brass, caught sweet and whole, to last beyond the maker of the song, because a dreamer dreamt.

What would you have of fancy or of fact if hands were all with which men had to build?

Your homes are set upon the land a dreamer found. The pictures on its walls are visions from a dreamer's soul. A dreamer's pain wails from your violin.

They are the chosen few—the Blazers of the Way—who never wear Doubt's bandage on their eyes—who starve and chill and hurt, but hold to courage and to hope, because they know that their is always proof of truth for them who try—that only cowardice and lack of faith can keep the seeker from his chosen goal, but if his heart be strong and if he dream enough and dream it hard enough he will attain, no matter where men failed before.

Walls crumble and empires fall. The tidal wave sweeps from the sea and tears a fortress from its rocks. The rotting nations drop from off Time's bough, and only things the dreamers make live on.

They are the Eternal Conquerers—their vassals are the years.

Copyright by Herbert Kaufman

The United Independent Telephone Association of America

New Association Organized at Pittsburgh on January 16 at Meeting of Representatives of Companies in Pennsylvania, West Virginia, New York and Ohio—Only Companies Independent of and Not Owned or Controlled by A. T. & T. Co., Directly or Indirectly, Eligible to Membership

The United Independent Telephone Association of America was organized Thursday, January 16, at a meeting at Hotel Antlers, Pittsburgh, Pa., which was attended by about 100 representatives of Independent telephone companies in Pennsylvania, West Virginia, New York and Ohio. J. Walter Barnes of Fairmont, W. Va., presided at the meeting and H. E. Webb, of Pittsburgh, acted as secretary.

B. G. Hubbell of Buffalo offered the following resolution, which was adopted: "This association shall be composed of members who represent telephone companies independent of and not owned or controlled by the American Telephone & Telegraph Co., directly or indirectly; and no person or company shall be eligible to membership in this association who represents a telephone company in which the A. T. & T. Co., or any of its associated or allied companies control or hold a substantial financial interest; and in the event that any such interest or control shall be acquired by the A. T. & T. Co. or any of its associated or allied companies, the membership so affected shall immediately cease."

The chair appointed as a committee on credentials the following: B. G. Hubbell, Buffalo; T. J. Shufflin, Butler, Pa.; Chas. West, Philadelphia; J. K. Brown, Brookville, Pa.; and C. F. Bender, Pittsburgh. A nominating committee was selected to choose officers and had not reported when this issue of TELEPHONY went to press. A full report of the meeting will appear in next week's issue.

The Convention of Illinois Independent Telephone Association

Best Convention in History of Association—Strong Papers on Various Topics and Spirited Discussions—Aims and Purposes of New Service Association—Announcement that F. L. Eldridge Has Been Made Field Manager of Service Association

The best convention which the Illinois Independent Telephone Association has ever held, took place on January 14, 15 and 16. Close attention and careful consideration were given all questions which were brought up. After an extended argument it was decided to neither endorse nor oppose the proposed state public utilities law, but a committee was appointed to watch developments. Resolutions were adopted endorsing the National Independent Telephone Association and its administration and pledging support to it and the state organization. The latter is in the most prosperous condition in its history, having over $500 in the bank and it will have $1,000 cash by April. It was recommended that the clearing house expand and that the clearing cost be lowered from twelve to six per cent. This will be considered by the executive committe of the clearing house at a meeting next month.

Frank L. Eldridge.

The first session of the convention, Tuesday afternoon, was devoted wholly to an informal discussion of the affairs of the Independent Toll Clearing Co. A large majority of the stock was represented at this meeting, which resulted in a thorough canvassing of the situation and the decision to hold formal meetings, both of stockholders and directors Wednesday evening.

On Wednesday morning the regular proceedings were begun, a welcome to the delegates being given, in the mayor's absence, by Willis Evans, secretary of the Peoria Association of Commerce. Mr. Evans declared Peoria to be an ideal convention city and heartily welcomed the visiting telephone men. He certified that a recent trip through the local exchange of the Interstate Independent Telephone & Telegraph Co. had opened his eyes wonderfully to the need of a fuller understanding of telephone operation on the part of the public.

L. A. Herrick, of Freeport, president of the association, responded fittingly.

The reading of the minutes of the last meeting was dispensed with, by common consent; the treasurer's report was turned over to the auditing committee.

H. D. Stroud, traffic manager of the Illinois Telephone & Telegraph Co., Chicago, read a paper on the by-products of the telephone business, offering many valuable suggestions to operating telephone men.

He was followed by J. A. Seals, of the traffic department Interstate, of Aurora, with a paper on traffic. Mr. Seals brought out a number of strong points illustrating the necessity for strict traffic supervision and the use of modern equipment and operating methods. He spoke particularly of the benefit to be had through operators' schools.

Both these papers will later be abstracted and printed in TELEPHONY.

In the afternoon session the president named the resolutions, auditing and nominating committees, after which

Frank L. Eldridge, assistant secretary of the Central States Telephone Service Association, made an able and illuminative talk on the aims and purposes of that organization.

He was followed by J. W. Callahan, president of the Service association, and general manager of the Chicago Independent. Mr. Callahan spoke for some time, his main theme being the need for just such an association as the Service, and what it has already accomplished. He declared his faith in the power of associations to produce the best possible results, illustrating this by showing what they have done for the railroads of the country.

He affirmed his belief in the bright future of Independent telephony, and asserted that he was prepared to back up strongly every move looking to the strengthening of the movement.

It was announced at this time that Mr. Eldridge had been made field manager for the Service association and will hereafter devote his entire time to the interests of that organization. He will be at the call of members at any time and will keep them in close touch with the Service committees, engineering, traffic and commercial. He will actively and personally canvass for new members, attending district and state conventions, and also calling, when occasion warrants, special neighborhood meetings of managers for that purpose.

The Central States Telephone Service Association, therefore, may be said to be fairly launched. Until it is well under way and wholly self supporting, its expenses are being largely met by a few of the larger companies on its membership list.

H. B. Gilmore, manager of the Clearing House, read a paper on the relations between the companies and the Clearing House, which was a strong plea for co-operation and an argument for the benefits sure to result. An abstract of this paper, also, will shortly appear in TELEPHONY.

The meeting was then thrown open and several members volunteered information as to what 1913 held for them. Among these was Manford Savage, of Champaign, president of the National Association, who predicted the biggest and best convention ever held, for next month, and urged everybody to come.

On Thursday morning, J. W. Coffey presented a strong paper on the need of accurate accounting which Manford Savage, president of the National association, strongly endorsed. C. H. Hood showed several important legal rights not generally known, and Mr. Savage developed the subject which was followed by general discussion. L. C. Griffits argued for co-operation and fairness, giving the Independents a little the best always as against the Bell. This was an extemporaneous talk, delivered in a convincing manner. It brought up an argument on the public utilities law which resulted in the adoption of the resolution as previously stated.

Officers for the ensuing year were elected as follows: President, J. W. Barrett of Pekin; vice-president, F. W. Ash, of Kewanee; secretary-treasurer, B. F. Baker, of Leroy. The executive committee is composed of the officers and Glandon Herrick. Chas. H. Hood and Ed. Starrett, of Sullivan.

In the afternoon, an operators' school was held at which there was a large attendance. The switchboard used for demonstration purposes was supplied by the Stromberg-Carlson Telephone Mfg. Co.

In the evening a fine banquet was served at the Jefferson Hotel, at which a number of good speeches were made. The banquet, which was complimentary to those in attendance, was given by the association.

The various papers which were read at the convention will be published in future issues of TELEPHONY.

The manufacturers were well represented. The Kellogg Switchboard & Supply Co., of Chicago, showed a 150-line magneto switchboard, equipped for double supervision; a direct current harmonic pole changer set; "howler"; farm line telephones; intercommunicating set; a full line of common battery instruments; telephones adapted for converting from magneto to common battery; lightning arrester; and a line of common battery switchboard samples. The exhibit was in charge of A. J. Carter, from the factory, and George H. Crandall, Illinois representative.

The Dean Electric Co., Elyria, O., was represented by Price Weinmiller, of Springfield, and J. D. Kratz, of Madison, Wis. The company showed a full line of all steel telephones, desk and wall type; switchboard parts; bedside set (an adaptation of the wayside microphone set); and a small unit type relay.

The Cracraft, Leich Electric Co., of Genoa, Ill., had on exhibition the new automaphone equipment, including its latest development, the automaphone P. B. X.; new and standard common battery telephones of all kinds; the Stewart test set (for which the company manufactures several of the parts); and a line of parts of various kinds. A. J. Kohn, sales manager, was in charge, assisted by the northern Illinois and southern Wisconsin representative, T. J. Gullion.

The Monarch Telephone Mfg. Co., of Ft. Dodge, Iowa, was represented by Walter H. Trimm, its secretary and general manager, and G. O. Wilson, formerly representing the company in Texas, but now covering the Illinois territory. The company exhibited a standard 100-line magneto board, with bridged and series cord circuits; four-party selective system; magneto and common battery equipment; a switchboard illuminating lamp; demonstrating outfit of Monarch direct current selective system; an all steel wall telephone of which 2,500 are now being made for the Ft. Dodge Telephone Co.; and sample parts of Monarch magneto multiple boards.

E. C. Lewis, Chicago sales manager for the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., was on hand, as was also Paul Meyers, the company's Illinois representative.

J. G. Mitchell, sales engineer for the North Electric Co., of Cleveland and Chicago, was there prepared to tell of the beauties of the Automanual equipment.

The Illinois Electric Co., of Chicago, was ably represented by Dewey Newman.

The Coffey System & Audit Co., of Indianapolis, displayed its special telephone accounting forms, books, etc., with John W. Coffey in charge. Mr. Coffey states that 1913 looks as though it would be bigger than any year his company has yet had. He has just installed the Coffey system for the Monticello (Ill.) Telephone Co., and will proceed immediately after the convention to Princeton, to install it for the Princeton Telephone Co.

The Automatic Electric Co., of Chicago, was represented by C. G. Williams.

C. A. Anderson was at the convention headquarters for the American Electric Co., of Chicago. He showed a full line of telephones, switchboard parts and Burns' specialties, telephone brackets, etc.

A. V. Ward, for the National Carbon Co., of Cleveland, was among those registered.

The American Telephone Fire Alarm Co., of Chicago, was represented by its engineer, David G. Dee.

Illinois Property Changes Hands.

The West Liberty Telephone Co., West Liberty, Iowa; has purchased the exchange, toll lines and equipment at Eureka, Ill., and C. F. Melick, associate manager of the West Liberty company, has assumed charge of the Eureka plant. M. F. Melick & Sons bought the West Liberty plant six years ago and after installing a complete new equipment, brought the exchange to a highly successful condition, C. F. Melick's efforts being responsible in a large share for the growth of business.

The Selection and Proper Care of Dry Cells for Best Results

Effects of Temperature, Proper Connections and Other Conditions on the Ultimate Service Life of Dry Cells—Precautions to be Observed When Purchasing—Care During Storage and Service—Connections for Maximum Efficiency and Best Service

By W. B. Pritz

The consumption of dry cells in this country has steadily increased, until the annual production now numbers far into the millions. They form, perhaps, the most convenient and economical source of electrical energy for use in all those services which require small amounts of energy intermittently, such as the operation of bells, buzzers, small lights, medical coils, electric clocks, etc. Great numbers of cells are consumed in telephone practice and in the ignition of gas and gasoline motors.

Most consumers of cells are, perhaps, less familiar with the source of energy they use, than any other class of users of electrical energy. This is due to the nature of the services in which dry cells are employed. The motorist, stationary engineer, and the householder are not necessarily electricians. Realizing these conditions, the manufacturers of cells have designed them so that the minimum amount of precaution need be taken in caring for and installing them in service. They are, however, susceptible to mistreatment.

In this paper it is the desire to give some suggestions which have been found valuable regarding the selection and care of dry cells.

Selecting the Proper Cell.

There are numerous grades and brands of dry cells manufactured, varying greatly in quality, some being very efficient and some almost worthless for all but extremely light service.

From among these multitudinous brands, the consumer must select that one brand which fulfills best his praticular requirements. In this selection the purchaser must either accept the guarantee of the manufacturer or he must satisfy himself as to the superiority of the cell by such tests as he can afford to make. The latter alternative is open to all large users, and for their benefit reliable methods of testing have recently been outlined by the American Electrochemical Society.*

The cost of making such tests prohibits their use by the small consumer. In this case a brand of cell known to be reliable and one with a reliable guarantee should be selected. His position is very similar to that of a man buying soap. He does not pretend to test a piece of each bar he purchases, but rather selects a brand made by a reputable house of long standing, a branch which, he feels sure, is kept up to standard quality by the continual watchfulness of the manufacturer. Although the average dry cell user cannot make satisfactory tests upon the dry cells he buys, he may be sure that tests have been made by the manufacturer, provided the cells he selects are of a reputable brand. It is well to be cautious regarding new cells purported to be revolutionary in character, giving abnormally high voltage, current, etc. These properties are easily increased by certain means, in most cases at the expense of the service life of the cell.

It is almost universally the custom before accepting a cell to read its short circuit current. This procedure is always advisable, yet unless the user is familiar with the particular brand of cell he is testing, his judgment of it is apt to be entirely erroneous, since there is no relation between short circuit current and the service obtainable from a cell.

This lack of relationship between amperage and service is shown by Fig. 1, in which the height of the plain rectangles represent current values and that of the shaded rectangles, service values. In all cases the values are given as percentages of the amperage and service capacity of brand *A*, which is taken as a standard and given the value 100 simply for convenience.

It is evident from this chart that there is no connection between the amperage and service capacity of cells. If one is familiar with any given brand, the current reading may be

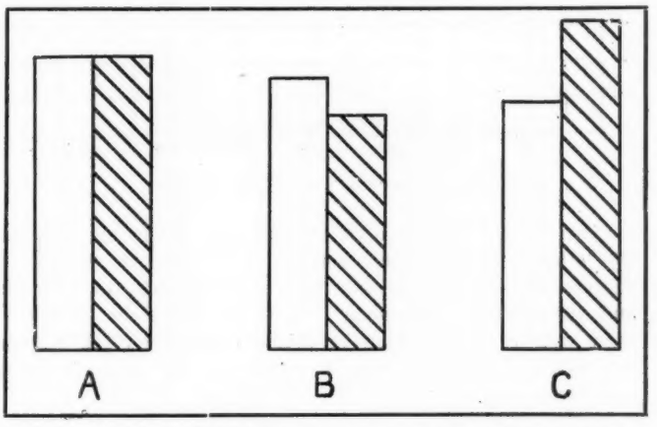


Fig. 1. Lack of Relationship Between Amperage and Service.

valuable as indicative of the age or of the abuse of a cell, but the current reading of an unfamiliar brand is insufficient evidence upon which to base a judgment regarding its ability to furnish efficient service.

In speaking of short circuit current it is well to point out that low temperatures will decrease and high temperatures increase, the amperage of any dry cell. Hence the current should be taken only at ordinary room temperatures.

In purchasing dry cells, those with bulged or cracked seals should not be accepted, as such seals indicate rough handling or exposure to too high a temperature during transportation or storage. On light services, in which a cell may last six months or a year, a good seal is essential since the value of a cell as a source of current depends primarily upon the action of the electrolyte, and the drying out of this constituent, due to faulty seals, will cause a shortened period of service.

The cell with corroded brass terminals or one from which the electrolyte is leaking, should be avoided. Electrolyte, coming in contact with brass terminals, or connecting wires, rapidly corrodes them, and if the products of corrosion find their way into the cell, rapid deterioration will result.

In the case of many brands it is impossible for the purchaser to know how long the cell has been in stock. In general, new cells should be insisted upon, for even when not in use, there is always more or less action taking place internally, which in time impairs the efficiency considerably. Some manufacturers recommend that cells be placed in service within 60 days after manufacture.

Care of Cells During Storage.

Most cells pass through a period of storage before being placed in service, either in the warehouse of the dealer or in the shop or garage of the consumer.

*Trans. American Electrochemical Society, Vol. XXI.

The deterioration during this period is influenced to a great extent by the nature of the place of storage. One of the greatest factors affecting this deterioration is the temperature. In order to determine the magnitude of the temperature effect, cells were stored at seven different temperatures, and

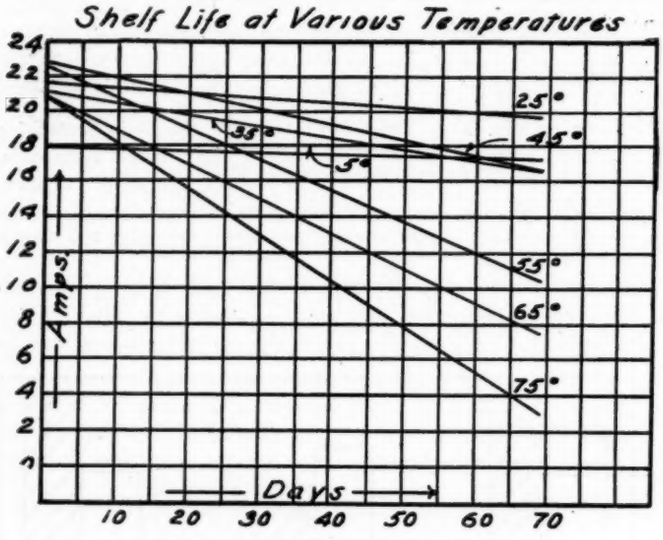


Fig. 2. Deleterious Effect of Heat.

readings of the short circuit current were taken at intervals. The temperatures selected were: 5, 25, 35, 45, 55, 65 and 75 degrees Centigrade, corresponding to 41, 77, 95, 113, 131, 149 and 167 degrees Fahrenheit. Some of the higher temperatures will, no doubt, never be encountered in dry cell storage but 45 deg. C (113 F.) may be reached in any stove corner or near steam pipes.

In the table below are shown the initial current readings of the cells at room temperature, also the readings at room temperature after having been stored for ten weeks at the temperatures shown in the first column:

Storage temp. degrees Cent.	Current at room temp. Initial.	After 10 wks.	% Drop in current in 10 wks.
5	21	19.3	8
25	21	17.8	15
35	19.4	14.5	25
45	21.8	14.0	36
55	20.1	8.8	56
65	20.2	3.1	85
75	19.8	1.0	95

The deterioration increases markedly with the storage temperature. The deleterious effects of heat are better shown by Fig. 2, in which the lines are located by points representing readings taken throughout the storage test. The slope of each line represents the rate of falling off in current of those cells, stored at the temperature indicated on each.

It is evident from this data that dry cells should be kept in the coolest place available. Freezing temperatures cannot harm a cell, provided it is kept dry. Cells have been exposed to such low temperatures that they were frozen solid within and gave practically no voltage or amperage. These same cells, when warmed again to room temperature, resumed their normal voltage and amperage.

Dampness, especially if the atmosphere is saline as is the case near the coast, tends to corrode the terminals of the cell. In extreme cases the jackets may become wet.

It may be said then that cells should be kept dry, out of the sun, and away from steam pipes, registers, stoves, or any other source of heat, in which case there should be no abnormal deterioration during storage.

Care of Cells During Service.

Dry cells have such simple connections that but few precautions need be taken in installing them in service.

In many cases cells are not properly inserted in the battery box, being crowded too tightly against one another, and not properly placed. Fig. 3*A* shows the right and Fig. 3*B* the wrong way of placing cells when connecting them in series. As placed in Fig. 3*B*, the binding post on the zinc of one cell comes in contact with the neighboring cell. If, through jarring or jostling, the paper jacket of the latter cell is worn through at the point of contact, this cell will be subjected to a dead short circuit and ruined. Short circuits are much less likely to occur if the cells are placed with the positive and negative terminals *out of line* as in Fig. 3*A*.

Insulated connectors or wires should always be used for connecting cells to form a battery. Fig. 4 illustrates a condition which often exists when bare wires are used for this purpose. Initially, as shown in the upper sketch, the connecting wire is carefully raised above the zinc can. However, through accident, the wire may be depressed until it touches the rim of the zinc, in which case the cell indicated is short circuited.

Before a battery is installed, the battery box should be cleaned thoroughly and all salt deposits or moisture from previous installations eliminated. An old storage battery box may be ruinous to dry cells, unless it is freed from all traces of acid which may have leaked from the storage battery.

Temperature plays an important role in determining the service which may be obtained from a battery of dry cells, the effect depending upon the nature of the service. The following data was obtained from service tests upon 6-inch cells at the seven different temperatures previously mentioned. In all, five separate tests were made at each temperature. The drain to which the cells were subjected approximated those met with in ignition service.

The following table shows the average results obtained. The service at 5 deg. has been given the value 100, that at the other temperatures being expressed as percentages of this value:

Temperature Centigrade.	5°	25°	35°	45°	55°	65°	75°
Comparative service....	100	145	158	145	113	92	83.5

The curve in Fig. 5 has been plotted from these values.

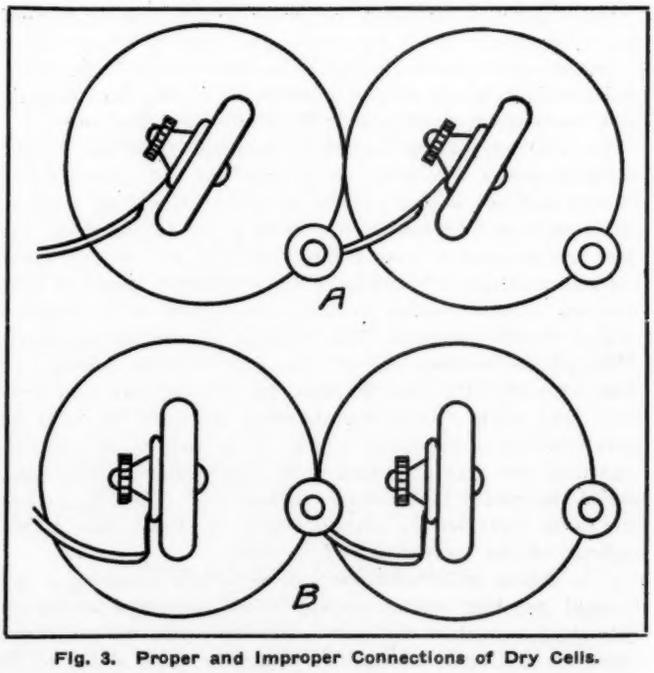


Fig. 3. Proper and Improper Connections of Dry Cells.

It is seen from the shape of the curves that on *heavy services* such as ignition, greater efficiency can be obtained when the battery is maintained at temperature of 35 deg. Centigrade (95 deg. F.).

This knowledge might prove advantageous in stationary

gas engine practice, a large range of temperatures generally being available in the neighborhood of the engine.

On *light drain* service such as the operation of door bells, buzzers, telephone transmitter circuits, etc., the effect of temperature is very different, as is shown by the following data obtained from a test upon cells subjected to a discharge very similar to those met with in telephone practice. The same temperatures were used in this work. The following table shows the comparative service obtained, expressed as percentages of the service given at 5 deg. Centigrade. Each value is the average of three separate tests:

Temperature degrees Cent.	Comparative service.
5	100
25	93
35	82
45	63
55	47
65	39
75	32

On such service, as indicated by the above values, there is a steady decrease in the life of a battery with increasing temperatures. Hence, cells on this service should be kept as cool as possible.

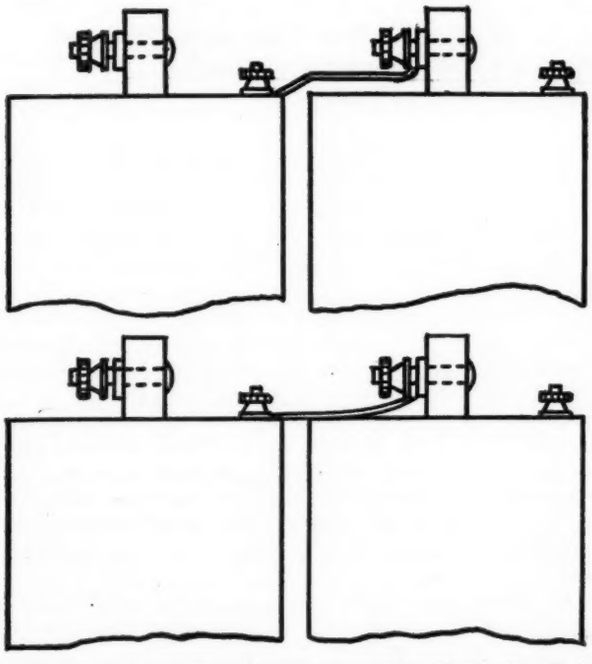


Fig. 4. Bare Connecting Wires Frequently Short Circuit Cell.

The difference in the temperature effect upon heavy drain and light drain services, is just what might be expected from a consideration of the effect of temperature upon open circuit deterioration.

The length of service obtained from cells may be said to be determined by two factors. First, what may be called the ability of a cell to furnish energy, and second, the deterioration in the cell due to time alone (open circuit deterioration) regardless of discharge deterioration. The second factor is in operation at all times, during periods of discharge as well as periods of open circuit. It is constantly working against the first factor mentioned, viz., the ability of the cell to furnish energy.

Increasing temperatures not only increase the ability of a cell to furnish energy by decreasing the internal resistance, and rendering the chemicals contained more active, but also the deterioration due to time.

In heavy services, the energy is given up in such short periods that time deterioration has no great chance to make its influence felt. Hence increased periods of service are obtained with increasing temperatures up to a certain point, at which point the increasing temperature so stimulates time deterioration that the effect of the latter overcomes the increased ability to furnish energy and shortens the service period. This change from increasing to decreasing service with rising temperatures is shown at 35 deg. C. in Fig. 5.

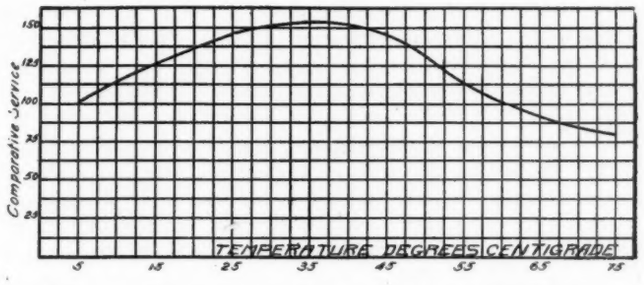


Fig. 5. Comparative Service at Various Temperatures.

In light services, the life of the battery is of such length that the time deterioration factor is predominant. Hence the steady decrease in service with increasing temperatures, as shown in the preceding table, is obtained.

A most important factor affecting the efficiency of dry cells, is the size of battery used. A cell will give greater efficiency when subjected to light drains than when the drain is heavy, i. e., the increase in service is not universally proportional to the drain, but somewhat greater than this. Therefore, the drain to which a cell is subjected should be as low as is practical.

There are three possible ways of decreasing the drain on a battery of cells.

1. The voltage of the battery may be decreased by decreasing the number of cells in series.
2. The resistance of the circuit may be increased.
3. Additional sets of cells may be connected in multiple.

In practically all services the first two methods cannot be employed, for most apparatus has a definite fixed resistance and is made to operate within but a small range of voltage values. The third method may always be employed. Within certain limits great advantages are obtained by increasing the battery in the multiple direction.

No definite rule covering the number of sets of cells to be connected in multiple can be stated, for the advantage to be obtained is dependent entirely upon the severity of the service. Were it not for the deterioration always in progress in a cell, which has been called open circuit deterioration above, increased advantage might be indefinitely obtained by increasing the number of cells in multiple. However, the

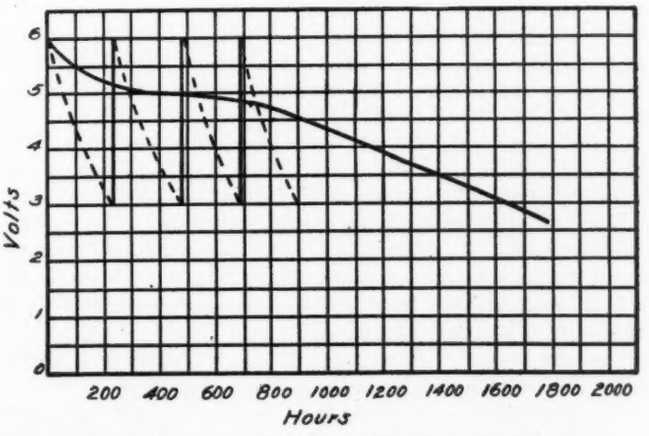


Fig. 6. Advantages of Use of Multiple Sets of Cells.

operation of this factor limits the advantage in any service, for it is obviously futile to employ so many sets of cells in multiple that the life of the battery is determined more by open circuit deterioration than by the electrical properties of the cell.

On light service such as the operation of telephones, etc., it would be useless to use cells in multiple, for one set of cells often lasts from one to three years, a period during which open circuit deterioration is much more influential than any other factor.

On more severe services, the use of multiple sets of cells is very desirable and great advantages are obtained. Fig. 6 illustrates this advantage very clearly. The dotted curves represent the drop in voltage of four batteries, of four dry cells each connected in series, when discharged successively on a service approximately the severity of ignition. The full line curve represents the corresponding drop in voltage of a single battery composed of four sets of four cells, each connected in multiple, when discharged on the same service.

The drain per cell in the latter case was, therefore, but one-quarter as great as the drain per cell in each of the four single batteries. As a result, the curves show a gain of nearly 100 per cent. in service life by using 16 cells connected in the form of a series-multiple battery, instead of using the cells four at a time. In other words, for the same expenditure of money for cells, nearly twice as much service was obtained.

On very severe service it may be advisable to use as many as six, eight, or even ten sets of cells in multiple. In most cases, however, the advantage begins to disappear when more than four or five sets are used.

The dry cell, when treated properly, is a very dependable and convenient source of current. Too often it is charged with unsatisfactory performance, when the fault might be remedied by a little thought and foresight.

Sues to Break up Telegraph Monopoly in Mississippi

Attorney General of State Brings Action Against A. T. & T. Co., Both of New York and of Mississippi, Cumberland Telephone & Telegraph Co., and Western Union Telegraph Co., Alleging Combination and Conspiracy in Violation of Anti-Trust Laws

Suit has been entered by the attorney general of the state of Mississippi against the American Telephone & Telegraph Co., the Cumberland Telephone & Telegraph Co., the Western Union Telegraph Co. and the American Telephone & Telegraph Co., of Mississippi, for violation of the anti-trust laws of the state of Mississippi. The maximum penalty of $5,000 a day is asked, also an injunction permanently forbidding the A. T. & T. Co. to hold stock in any of the other companies. The suit is filed in the Chancery Court of Lauderdale county.

It is pointed out in the attorney general's complaint that, prior to 1909, the Cumberland company, which is owned by the A. T. & T. Co. was competing, together with the parent company, against the Western Union Telegraph Co. for telegraph business. Since that time, it averred, the A. T. & T. Co. having also secured control of the Western Union, competition in the telegraph business within the state has ceased, except for that offered by the Postal Telegraph-Cable Co., The Mackay Companies.

It is asserted that, in many instances, the Cumberland and the Western Union offices have been combined; that telegraph charges have been added by the Cumberland to its telephone bills against subscribers and collected by it; and that Cumberland telephone operators invariably connect subscribers with the Western Union when the word, "Telegram" is given them, instead of with the Fostal or any other competing telegraph companies. The American Telephone & Telegraph Co., of Mississippi, is referred to as but a creature of the A. T. & T. Co of New York, which transacts the long distance business of that corporation in the state named.

"In the state of Mississippi, prior to November, 1909," says the complaint, "there was active competition among the Cumberland company, the Postal company and the Western Union, and among the said Postal company, the Western Union and the American Telephone & Telegraph Co., of Mississippi. The telephone business is a competitor of the telegraph business. Both telephone and telegraph companies are engaged in the transmission of information over wire by the use of electricity. But, during the last three years, competition between the Western Union and the said Cumberland company has ceased altogether and, since that time, the two companies have worked together and the properties owned by the two companies have been operated together and to the mutual benefit of each other, and against their only surviving competitor (in the telegraph business), to-wit: The Postal Telegraph-Cable Co."

The complaint asserts that this has been done with the deliberate purpose to create a monopoly in the telegraph business and that, when the one surviving competitor has been destroyed, the monopoly will be complete.

After stating that the offices of the Cumberland and the Western Union have, in many places, been combined under the same management, the charge is made that they also string their wires on the same poles and that each company has the use of the other's wires in the collection, distribution and sending of messages. The complaint then goes on, as follows:

"The said Cumberland company and the said American Telephone & Telegraph Co., of Mississippi, work in concert and harmony with the said Western Union company to facilitate the handling of the Western Union telegraphic messages and to put all competitors of the Western Union company to that extent at a disadvantage. Among other things besides those enumerated, Western Union telegrams are handled and transmitted by the said Cumberland company at telegraph rates, or at no cost at all, while the Postal Telegraph-Cable Co. messages are handled only at telephone rates."

"The said defendants together form a trust and combine," continues the complaint, "in violation of the laws af this state, and they are engaged and bound together in a criminal conspiracy inimical to the public welfare."

The A. T. & T. Co., of Mississippi, the Cumberland and the Western Union, the attorney general insists, "are each and all guilty of a violation of the laws of the state of Mississippi prohibiting trusts and combines, not only in respect to the acts and practices above enumerated and defined, but because they have allowed their capital stock to be owned and controlled and their business and policies to be owned and controlled by the said American Telephone & Telegraph Co. And the last named company has formed the said combination and monopoly and is now en-

gaged in operating, maintaining and continuing it."

Discrimination is also charged against the defendants in that they are alleged to charge less for service in certain parts of the state than they do in other parts in the same class. In conclusion, the attorney general asks that the defendants be assessed by the court the maximum penalty prescribed by law, or $5,000 per day, from the time when the combination was effected up to the date of the final decree. He also asks that the American Telephone & Telegraph Company be permanently enjoined from continuing to own the stock of the other defendant companies, or any other of their securities.

Woodrow Wilson Declares Definitely for Competition

In Address Delivered at Banquet Given in His Honor by Chicago Commercial Club, President-Elect Asserts that Free Competition Must Prevail in United States and that Business Men Must Aid in Bringing It About

"The business of the United States must be set absolutely free of every feature of monopoly," said President-elect Woodrow Wilson, in Chicago, last Saturday. The occasion was a banquet given in his honor by the Chicago Commercial Club.

"If we can prevent monopoly and produce competition wherever men are strong enough to set it up," he continued, "then there will not be any necessity for the government to come in and take a hand in administering the business of the United States."

Mr. Wilson declared that the recent change in the affairs of this country was not merely political, "it is a change in the attitude and judgment of the American people."

He expressed the hope that the big business men of the country would recognize this fact and would voluntarily aid in the necessary readjustment of business conditions—not be forced by law to readjust their affairs.

After dealing with the question of the restricted systems of credit which now prevails, and declaring that "the credit of this country must be open upon equal terms" before bankers would enjoy the confidence of the public, he said, in part:

"And then in addition and on top of all this we must see to it that the business of the United States is set absolutely free of every feature of monopoly.

I notice you do not applaud that. I am somewhat disappointed, because unless you feel that way the thing is not going to happen, except by duress, the worst way in which to bring anything about, because there will be monopoly in this country until there are no important business men in this country who do not intend to bring it about. I know that when they are talking about that they say there is not anybody in the United States who ever intended to set up a monopoly. But I know there are some gentlemen who did deliberately go about to set up a monopoly. We know that they intended to do it, because they did it, and because they did it in a way which inevitably led to monopoly. We know it because they organized their business, or rather capitalized their business, in such a way that they could not endure if they were not out to set up a monopoly.

You cannot carry water against competition. I was accused the other day, and I am happy to plead guilty, of saying the same things after I was elected that I said before I was elected. Now one of the things that I said most often during the campaign was this: 'I don't care how big a particular business gets, provided it grows big in contact with sharp competition, and I know that a business based upon genuine capital which has not a drop of water in it, can be conducted with greater efficiency and economy than a business that is loaded with water.'

Just as soon as the gentlemen who carry water, some of them on both shoulders, are exposed to the competition of men of equal wit who do not carry water, the thing is settled, and I am willing to abide by the results. If we can prevent monopoly and produce competition wherever men are strong enough to set it up—I am not interested in setting men up in business, but I am interested in leaving the doors open so that strong men at least can come in and set it up for themselves—and so soon as you produce that situation, then there will not be any necessity for government to come in and take a hand in administering the business of the United States.

There was a time—and it is going to come back—when this country was able to take care of itself. It will be abundantly able to take care of itself when its energies are really realized and no man is afraid of anybody else; when every man has the same right to conduct an independent business that every other man has; when every man knows that the business community is open for him to enter and be welcome. Then there is going to come a season of prosperity in this country which it has never known or dreamed of, but not until then. You cannot have prosperity personally conducted. You cannot have prosperity conducted by small circles of individuals.

No body of men less than the whole manhood of the nation knows enough to be trustees for the rest. The only thing that makes society various and rich is that men whom we never heard of can come in at any time and put us on our mettle to beat them.

I glory in democracy for that alone, that it is a competition into which any man may enter no matter what his antecedents, no matter what his training, no matter what his origin, no matter what his natural handicaps. The greatest pleasure of a college man is to see some awkward youngster, whose brain seems at first to run sluggishly, come in among the smart set and put them to their mettle to beat him, not only at the use of his brain but at the use of his muscle, the skill of his hand, the adroitness of his address, his mastery in a company of cultivated men. That makes me proud when the men with a handicap win the race, and win it as if they started at scratch.

So that what I have come to say to you tonight is this: Just as soon as you make up your minds that there shall be no monopoly in the United States, there won't be any monopoly in the United States.

We art witnessing a new age. The nation has awakened. We have asked for and obtained a change of venue. We used to try every governmental case before a selected jury, and the jury selected were always the same men. Now we are trying it before the people of the United States, and the people of the United States are going to reach a true verdict. There is not going to be any disagreement in the jury; it is not going to be hung, and it is not going to stay out long.

Just as soon as the facts are laid before it, it is going to come in with its judgment, and its judgment is going to be executed in the political action of the United States. That is what I mean by a change of venue. The jury is drawn from a wider panel, there are more things in the hat, and that jury is now of the temper of the people who witnessed the setting up of the institutions under which we have been so long free and so long happy."

Improvements at Mt. Pleasant, Iowa.

The Mt. Pleasant (Iowa) Telephone Co. is putting up a new exchange building, installing a new Kellogg common battery switchboard and placing some 2,000 ft. of underground conduit and 7,000 ft. of cable. The company looks forward to the most prosperous era of its history.

A Million for Saskatchewan Extension.

The Saskatchewan government has appropriated $1,000,000 for telephone extension this year.

Some Big Problems

Directorships—Bank Profits

By J. C. Kelsey

Young man, go west! It was Horace Greeley who made this oracular remark.

Horace Greeley may have been right at the time. Everyone thought the gold was under one's feet, out West.

No one at that time seemed to know that the gold was right under the New Yorker's feet.

Like many other things, the ravages of time have not missed the Greeley idea.

Young man, don't go West! Do something infinitely better. Young man, be a director!

It is pretty soft to be a director, especially in most American corporations. All you have to do is to attend a meeting, keep real quiet or severely criticize the loan or sales department, and draw your gold eagle or double eagle!

They say in China that the job of director has some responsibilities. When a bank fails there, the people do not crowd frantically around the bank doors. They merely listen for the whirring knife, self inflicted, which sends the guilty or unfortunate parties to the happy hunting-ground of finance.

There are directors who direct. At least, there are said to be some, but history sometimes has great shortcomings—it reveals no directing director.

It is generally suspected that the director who directs is as scarce as the teeth of a hen.

A man has just been called before the Pujo committee and asked a great many questions. His name is George F. Baker. He is a director in so many institutions that you can't count them.

He gave us a new code of propriety. We must look sharp these days, because there never was such a chance to learn.

Mr. Baker could see no impropriety in being a director in two or more competing banks, railroads or any industrial corporations. The advantage is this: that, by having interlocking directors, "differences between the roads can be so easily adjusted."

All of which is true. You can't dispute it!

Mr. Baker said that voting trustees of a corporation never assembled, and that most of them were self-perpetuating. And the reason is—"if a corporation is going all right and paying dividends, why make any change?"

That is common sense. Why swap horses in mid-stream?

If you want to go to New York from Buffalo, you have the choice of several competing lines. You can take the Erie, Lehigh, Lackawanna or New York Central. Yet Mr. Baker is a director in all of these companies.

What is the public to believe? What do you believe? You believe, and you know, that there is no competition. Yet when you analyze the railroad conditions in question, what more competition is wanted than we have now?

I have made up my mind in regard to competition. It is what we want the other fellow to have. It is just like the tariff. The great majority want free trade on woolens, but you never hear any of the woolen people enthusiastic about it.

It is a local issue, pure and simple, and so is the question of competition.

I believe in competition generally, because it brings out the best efforts of human beings. Monopoly is self-cursed, and it soon clogs its own system.

Competition too, is deadly, since its stresses sometimes cause financial ruin. So a reasonable line must be drawn. Who will draw it?

One thing was disclosed in the questioning of Mr. Baker, which shows how easy it is to evade the law. When the railroads were forced to go out of the coal business, they formed a sales company, sold the mines to it and then bought coal at the mine from this sales company. They complied with the law in every respect.

We will never have laws to govern these matters, as long as laws are drawn up in the present harum-scarum way. As it is, laws are drawn up to govern people in other lines of business beside that of the law-maker.

The whole question of handling trusts is a difficult one. I doubt if Congress can do much.

Simply because each individual member is more or less of a commercial light-weight. He is not broad enough to solve a great commercial problem.

The men who can solve these problems are only on the defensive. They are not in Congress and could not afford to be.

I have spoken before of the tendency of the government to be better prepared to handle its cases. Look at the beef trust fizzle. The investigators for the government actually found out that the packers were losing money!

Honestly, this was a terrible joke on the government, but no one was really to blame. No one without great commercial training could get at the root of the matter.

By the way, these poor, poverty-stricken packers should now be investigated. They will be found now to be making money. A phonograph company has bought the squeal!

Hurrah! You now have an example of the greatest commercial triumph the world has ever known.

The packers have long worried about the fearful loss due to their inability to put the squeal to use. Today, a phonograph company picks up all the agonizing noises for the benefit of a neurotic public!

These packers certainly should get a Nobel prize—for development. Old Phillip Armour originally was but a pork-packer. Then he discovered that cattle and sheep could be slaughtered at a profit.

Then they began to buy chickens, because it combines nicely with the veal. Then they went into the tanning of hides—they make cheese—sauerkraut and pickles too, if you please.

Bless you! they handle soft drinks and soda supplies. I'll bet you that they will be in the phonograph business yet.

Likewise, the government fought the Standard Oil Co. It did not have the commercial training or wit to match the crafty Standard Oil crowd. It merely forced them into a more powerful position.

Talking about Standard Oil—it is queer how this company stands in the public mind. The only thing the company failed to do was to capitalize properly. If it had paid 8 per cent. on $500,000,000 worth of stock, no one would have peeped. But it paid forty per cent. on $100,000,000 which is, of course, a sin.

Then William Rockefeller is completing the unfortunate position of Standard Oil, by his evasions of Congressional summons. His folly gives the public the idea that there is a grave crime behind this secrecy.

When you get right down to it, the Standard Oil Co. is no worse than the other examples of industrial conditions.

I feel very, very sorry for John D. Rockefeller. His brother Frank lives on a Kansas ranch. He says that John D. is "living in a regular hell"—that he is the most "lonesome" man on the face of the earth, that all the big business men have dropped him like a hot cake, etc.

Honest, now, I believe John D. is the goat of the family. I believe you will find the recreant William, hiding so skillfully from Congress, is the real big money baron.

William built the Puget Sound extension of the Milwaukee railroad right out of his own pocket, so they say. That signifies quite a tidy fortune—to push a railroad over the Rockies and Cascades, unmindful of expense!

John D. is fearfully afraid of kidnappers. Say! What a ransom he would bring! He is even afraid they will steal his farmer brother Frank and make him pay. But Frank is a Kansas man—no one ever kidnapped a Kansan.

Would you trade places with John D.?

Talking about banks, we wonder why bankers are always complaining about currency acts and kindred troubles. It would seem that their greatest trouble is to handle the profits.

The First National was born during the war, with $500,000 capital. Since that time it has earned $80,000,000 for its stockholders—$80,000,000 scattered over 50 years makes $1,600,000 a year, which is quite a tidy income from $500,000—312 per cent. a year.

Since 1908, the bank earned 226 per cent. on its capital of $10,000,000. In 1908 the laws were changed. The bank had to meet new conditions. So it organized a new company called the "First Securities Co.," which took over the business which the bank could not do under the law.

The First Securities Co. has a capital stock of $10,000,000. So the bank declared a cash dividend of $10,000,000—and it went into the Securities company.

Again, I say, how would you like to be in a concern which can do financial wonders and where you don't have to dig up a dollar?

So you can see that any law-maker, so virtuously inclined to save the country, would be practically impotent in a contest with such gigantic minds and power as the financial crowd has.

Besides, they are entrenched. You know it is much easier to defend a position than to carry it by force.

Getting right down to brass tacks, how could any law cover such a condition as the First Securities Co.? It simply could not

The stockholders of the First National Bank have a right to start in another business enterprise. When their bank was denied the right to engage in a general security business, they did not need that ten millions of capital—

So they divided it up among their stockholders. And they in turn put the money into the Securities company, where they knew it would work over-time.

There is nothing so lovely as a big money-maker. But nothing offends as much as a losing venture—a failure.

It seems as if success is not a mediocre fellow. He piles it on thick or not at all.

Getting back to double, triple or quadruple directorship—that will be a big problem.

We are all familiar with the telephone situation, how directors are intermingled. The back files of TELEPHONY will show that there is a great deal of similiarity in the director question.

Men are directors in American Telephone, Western Electric, Western Union, General Electric and other large institutions.

Just how it will prove of advantage in the settlement of differences, it can not be seen. There is so little chance for differences!

If the government proceeds in the telephone case as it has in other cases, it will have its troubles. The telephone offers a peculiar condition which is best understood by those engaged in it. It will be another packer case, unless great care is exercised.

The Pujo committee is not doing any great harm to anyone. A good airing is good for everything—and some sunlight, too.

The public is being educated to the truth of the matter. If it chooses to keep on dealing with Wall Street, I don't see how anybody can complain.

What a bogy Wall Street is! They use it to scare the children into obedience, as a great goblin. How the farmer grinds his teeth at Wall Street and the poor Stock Exchange! It is just such devices as stock exchanges that enable the producer to get his price.

As the Standard Oil profited by going back into its subsidiaries, so would the farmers' prices go in the opposite direction without a Stock Exchange. Some authority has to be big enough to set a trading price.

Some people don't know their friends until it is too late!

The good of Wall Street lies in its being a good goat. It gets the peoples' minds off their own most imaginary troubles. No institution was ever more able to be a goat—so let the fun go on!

A few years ago, the whole country would have gasped at the temerity of Congress in questioning the money kings. But it is all a condition of the times.

Publicity is the cause of it. Publicity causes familiarity, and familiarity breeds contempt.

People know everything in the world at the breakfast table. The newspaper, telegraph and telephone are the agents of this pitiless publicity, which spares neither man nor beast.

It is almost as if we lived in transparent houses and all eyes could see our every movement.

People are fast finding out that Wall Street is composed of men with heartaches and headaches. When they once realize this very human fact, they will not bother them; they will but pity them!

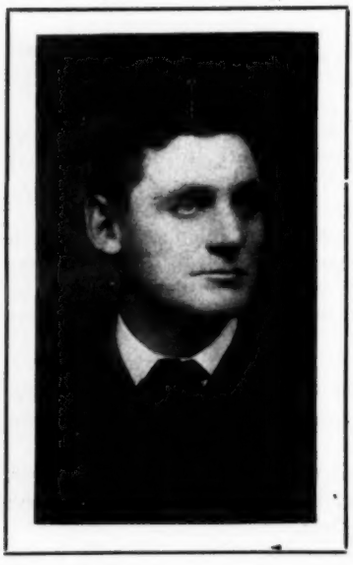
No one of my readers would care to make the sacrifices that go to make Wall Street successes. The Street it is a commercial will o' the wisp.

If you envy the man who is director of 40 railroads, 20 banks and 10 securities companies, wake up! It is not worth it. The problem looks big, but is it?

MORAL: Ask the Sphinx!

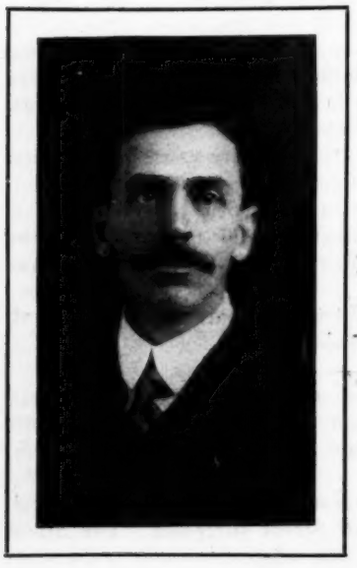
A Quartet of Men Prominent in the Telephone Field

WARREN B. SERVISS, superintendent of the Union Telephone Co., Owosso, Mich., was born in Oakland county, Michigan, May 20, 1865. He is an electric light and power specialist, as well as a telephone man, having been manager of the Greenville (Mich.) Electric & Power Co. for twelve years, in connection with his telephone work. His first association with the telephone business took place in 1883, when he became manager of the Michigan Bell plant at Greenville. He was manager of the Greenville Telephone Co. for four years and was later manager for the Citizens Telephone Co. after it bought up the Greenville Telephone Company's plant and franchise in that city. He has been with the Union Telephone Co. since 1902. He was educated in the grade and high schools of Greenville, Mich.



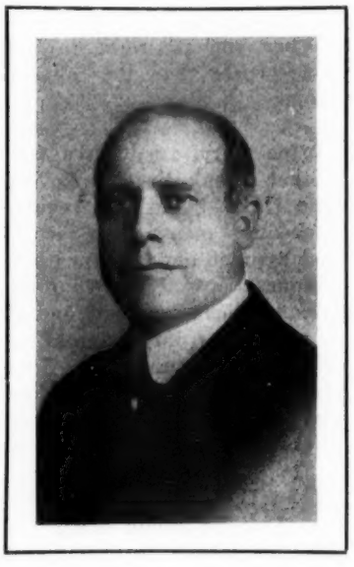
He is a member of Owosso Lodge No. 81, F. & A. M., Owosso Chapter No. 89, R. A. M. and of the Woodmen. Mr. Serviss has seen the telephone business grow in Michigan from the smallest beginnings to one of the greatest industries in the state and has kept pace with it.

CLINTON S. STICKNEY, inspector for the Brownsville Telephone Co., Brownsville, Maine, was born in that city December 15, 1875, and educated in the schools there, the University of Maine and a correspondence school. Mr. Stickney is a farmer by profession, taking the management of a farm in 1893 and acquiring its ownership six years later, in 1899.



In 1903 he organized the Pioneer Telephone System, of which he was the principal owner and the manager, continuing its operation until 1912, when the system was consolidated with the Brownsville Telephone Co. He is now part owner of the Brownsville Telephone Co., assumed the duties of inspector for that system at the time of the consolidation and has ever since borne that part of the operating responsibilities. His correspondence course was one in telephone engineering, in which he had long been interested. This aided him greatly in his telephone work. During his spare time in 1911 and 1912 he did general electrical contracting. He was on the board of selectmen of Brownsville during the years 1911 and 1912.

EDWIN R. HARDING, vice-president of the Holtzer-Cabot Electric Co., of Brookline, Mass., and in charge of the western office, Chicago, was born in Hampden, Maine, September 29, 1862. He is a graduate of Hampden Academy, Waterville (Me.) Classical Institute, Maine Central Institute Pittsfield, Me., and Bowdoin College, Brunswick, Me. He has the degrees of A. B and A. M. He is a member of the Golf Club, the Beverly and the Theta Delta Chi Fraternity. After graduation Mr. Harding taught for some time. While principal of the Winthrop (Mass.) High School he became interested in electrical work and, in 1891, entered the employ of the Edison General Electric Co., Chicago, as sales engineer. Later, in the same capacity, he was with the Ansonia Electric Co. This was followed by a partnership with E. W. Hammer, as Harding & Hammer, handling the the motor product of the Holtzer-Cabot Company. In 1897 he opened the Chicago branch for that corporation. He was instrumental in having the company manufacture telephone power plant equipment and kindred accessories.



LLOYD J. LAWRENCE is general manager of the United Telephone Co., Murfreesboro, N. C. By profession he is an attorney, being a graduate of the University of North Carolina. Mr. Lawrence has been practicing his profession since 1893. He is a member of the North Carolina State Bar Association and of the Commercial Law League of America. He is also a member of the Modern Woodmen of America. In 1905 he became manager of the North State Telephone Co., later being elected its president. When the United company succeeded the North State in 1912, Mr. Lawrence became general manager, a position which he has since held. His first interest and identification with the telephone industry was in 1903. He is president of the Citizens Bank, of Murfreesboro, and secretary and treasurer of the Chowan Motor Co., of the same city. With all of these responsibilities, Mr. Lawrence finds time to give considerable attention to his telephone business, of which he is manager in fact, as well as in name. He was born in Murfreesboro, September 24, 1871.

Convention of Western Pennsylvania Independent Association

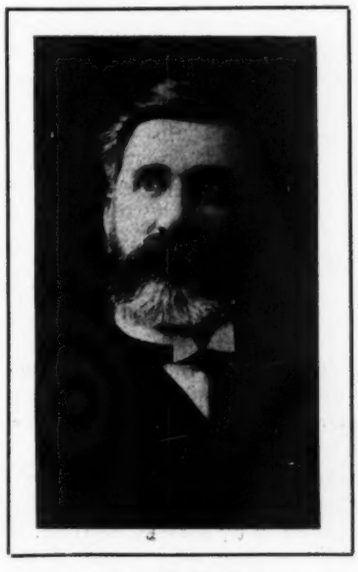
Large Attendance at a Most Successful Annual Meeting—Tentative Draft of Public Service Commission Law Provoked Lively and Extended Discussion of Physical Connection—Committee Recommends Incorporation of Proposed Long Distance Company

The fourth annual convention of the Western Pennsylvania Independent Telephone Association was held at the Hotel Antlers, Pittsburgh, Pa., Wednesday and Thursday, January 15 and 16. There was a large attendance of prominent operators affiliated with the organization, and a most successful meeting was held.

The convention opened with an afternoon session, President J. A. Haven, of Brookville, being in the chair. H. E. Webb of the Pittsburgh & Allegheny Telephone Co., acted as secretary as he has for years. The register showed the following were present, with the companies represented, when the meeting was called to order:

J. A. Haven, Summerville Telephone Co., Brookdale, Pa.
T. J. Shufflin, Peoples Telephone Co., Butler, Pa.
H. E. Webb, Pittsburgh & Allegheny Telephone Co., Pittsburgh, Pa.
A. M. Crichton, Tri-State Telephone & Telegraph Co., Uniontown, Pa.
Daniel Sturgeon, Tri-State Telephone & Telegraph Co., Uniontown, Pa.
S. D. Sawdey, Albion Telephone Co., Albion, Pa.
G. E. Crist, Blairsville Telephone Co., Blairsville, Pa.
Chas. E. Meds, Kittanning Telephone Co., Kittanning, Pa.
E. D. Schade, Johnstown Telephone Co., Johnstown, Pa.
Chas. F. Heidrick, Summerville Telephone Co., Brookville, Pa.
H. E. Bradley, Eastern Traffic Association, Philadelphia.
J. K. Brown, Summerville Telephone Co., Brookville, Pa.
J. Walter Barnes, Consolidated Telephone Co., Fairmont, W. Va.
J. N. Scott, Greene County Telephone & Telegraph Co., Waynesburg, Pa.
Chas. West, American Union Telephone Co., Philadelphia, Pa.
J C. Kelsey, Kellogg Swbd. & Sup. Co., Chicago.
C. D. Boyd, Kellogg Swbd. & Sup. Co., Chicago.
Don Gould, Kellogg Swbd. & Sup. Co., Cleveland.
C. M. Thompson, Kellogg Swbd. & Sup. Co., Philadelphia.
C. H. North, North Electric Co., Cleveland.
J. Henry Shafer, Chicago.
Byron L. Moore, Century Telephone Construction Co., Buffalo, N. Y.
John Z. Miller, Mutual Telephone Co., Erie, Pa.
Henry M. Camp, Beaver County Telephone Co., Rochester, Pa.
G. W. Herrick, Commercial Union Telephone Co., Ridgway, Pa.
W. L. Lindsley, Frick & Lindsay Co., Pittsburgh, Pa.
K. B. Schotte, Kittanning Telephone Co., Kittanning, Pa.
E. J. Moore, Farmers' Telephone Co., Point Marion, Pa.
J. A. Smith, The Transmitter, Ft. Worth, Texas.
C. H. Christney, Charlevoi Telephone Co., Charlevoi, Pa.
A. H. Alexander, Jr., Doubleday-Hill Electric Co., Pittsburgh, Pa.
F. C. Redfield, Stromberg-Carlson Telephone Mfg. Co., Philadelphia, Pa.
Wm. S. Paca, Petroleum Telephone Co., Oil City, Pa.
E. E. Gauss, Robbins Electric Co., Pittsburgh, Pa.
John H. Wright, Jamestown Telephone Co., Jamestown, N. Y.
J. W. Smith, Frick & Lindsay Co., Pittsburgh, Pa.
F. A. Rader, of Frank B. Cook, Chicago.
C. D. Conrow, Flushing Telephone Co., Flushing, O.
F. J. Goodman, Century Telephone Construction Co., Buffalo, N. Y.
F. H. McDowell, National Carbon Co., Pittsburgh, Pa.
D. G. Raley, Columbus County Telephone Co., Salem, O.
H. L. Lamb, California Telephone Co., California, Pa.
S. W. Stackhouse, No. Georgetown Telephone Co., No. Georgetown, O.
W. H. Wilson, Union Telephone Co. of Erie, Erie, Pa.
F. L. Clark, Dean Electric Co., Elyria, O.
F. S. Corse, American Surety Co., Fittsburgh, Pa.
J. H. Ainsworth, Automatic Electric Co., Columbus, O.
F. L. Middleton, North Electric Co., Cleveland, O.
H. B. McNeal, TELEPHONY, Chicago.
H. D. Fargo, TELEPHONY, Chicago.

Secretary Webb read the minutes of the last quarterly meeting held at Cambridge Springs, Oct. 10 and 11, and they were approved, as was the report of the treasurer.



J. Walter Barnes.

Messrs. Paca, Wright and Shufflin, forming the committee named to formulate a plan of procedure against the Clarion Telephone Co., for refusing telephone connections, were not ready to report and were given further time. Mr. Lamb made the same report for the committee appointed to take up the question of forming a new national association, and advised that a report would be made on Thursday.

E. D. Schade, of the committee on legislation, made an interesting report, in the course of which he read Section 24, of a tentative draft of a public service commission law, referring to connections between railroads, telegraph and telephone companies follows:

"Any two or more railroads, telegraph or telephone lines, or other public utilities engaged in the transmission of intelligence, whose lines or systems could readily be connected to form a continuous line of transportation or communication, shall construct and maintain such switch and other connections and interchange facilities as may be necessary therefor; provided that no such connection

shall be required for the purpose of establishing telegraph, telephone or other communication between different localities which can be communicated with by the lines of either utility alone, if the service tendered of such utility be availed of.

"The cost of constructing and maintaining any such connections and the allowance to be made for the interchange of service thereby, shall be fixed and apportioned by agreement between the parties thereto, or, in case of failure to agree, by the commission as provided in Section 56 of Article IV."

"Note.—It is not intended that under this act, it shall be the duty of, say, a telephone line, to permit purely local intercommunicating service, but only to reach different points not served by both utilities."

This opened up a discussion on physical connection, which brought out many diverse opinions. In the midst of the discussion a report was asked for from the committee on organizing a company to construct long distance lines. This committee was composed of Messrs. H. E. Bradley, E. D. Schade, W. S. Paca, Chas. F. Heidrick and H. E. Webb. As chairman Mr. Bradley presented a prospectus of such a company, recommending incorporating with a capital stock of $10,000, to be increased later to not less than $1,000,000. The report stated that even with the present poor facilities, the Independent companies in Pennsylvania in 1912 handled nearly 1,500,000 long distance messages. "With properly constructed long distance circuits, this number would have been three times as great," according to the report of the committee, "and we can, therefore, safely figure that the lack of these circuits has been the means of diverting just that many messages to the lines of the opposition companies." All circuits of the proposed new company will be of No. 8 B. & S. gauge copper wire and the first construction will be in main pole lines connecting Pittsburgh with Buffalo, via Butler, Oil City and Corry, and connecting Pittsburgh with Philadelphia via Johnstown, Altoona, Bellefonte and Harrisburg.

K. B. Schotte reported on a new advertising sign for toll stations, recommending the placing of the words "Long Distance" at one end, "Allied Companies" at the other, and "Independent Telephone" in the center. After some discussion, the report was adopted.

The discussion of the physical connection feature of the proposed law referred to by Mr. Schade was resumed and was participated in by Messrs. Shufflin, Paca, Sturgeon, Heidrick, Barnes, Wright and Schade. J. C. Kelsey of TELEPHONY's staff, was called upon for his views on the question and for information relating to the workings of state commissioners having jurisdiction over telephone companies. Mr. Kelsey related the experiences of Independent companies in Wisconsin, Michigan and other states having commissions, and stated that in the whole such bodies tend to improve matters. A strong sentiment adverse to physical connection developed at the convention, and it was decided to watch legislative developments at Harrisburg with much care. The following committee was appointed to study the proposed section submitted by Mr. Schade and report later to the convention, recommending what attitude the Independent association should take in the matter: Messrs. Schade, Heidrick, Shufflin, Paca, Schotte, Wilson, Bradley, Wright and Barnes.

While the committee was at work the convention called for remarks from Dr. Frank Hart, of Pittsburgh; Charles West, Philadelphia; J. A. Smith, Ft. Worth, Texas; H. E. Bradley, Philadelphia; J. C. Kelsey, Chicago; J. Walter Barnes, Fairmont, W. Va.; J. W. Wright, Jamestown, N. Y., and H. B. McMeal, editor of TELEPHONY. The convention then adjourned till Thursday, at which session the following officers were elected for the ensuing year: President, J. Walter Barnes, Fairmont, W. Va.; 1st vice president, Henry M. Camp, Rochester, Pa.; second vice president, K. B. Schotte, Kittanning, Pa.; secretary and treasurer, H. E. Webb, Pittsburgh; executive committee, J. A. Haven, Brookville; T. J. Shufflin, Butler; E. D. Schade, Johnstown.

The South Dakota Convention.

The annual meeting of the South Dakota Independent Telephone Association was held January 8 and 9 at the Carpenter Hotel, Sioux Falls. The attendance, while not as large as anticipated, was made up of practically all of the progressive telephone men in the state, and a most interesting and profitable convention resulted.

The program as given in TELEPHONY of January 4 was carried out. One of the questions which was discussed at length was "What compensation should the local exchange receive for handling the toll companies' business?" Most of those who took part in the discussion thought the toll companies had the best of the arrangements and that the local exchanges did not receive near as much as they should. It is intended to bring the matter before the State Railroad Commission in the near future in order to get a determination of the proper compensation.

The election of officers resulted in a complete change. J. A. Steninger, who has been vice-president for the past 10 years, or since the organization of the association, was chosen president. Dr. E. R. Buck, who has been secretary for the past seven years, was elected vice-president, and A. S. Hall, president for the past three years, was made secretary.

The following is the roster of officers for 1913: J. A. Steninger, Parker, president; Dr. E. R. Buck, Sioux Falls, vice-president; A .S. Hall, Redfield, secretary and treasurer; H. P. Hartwell, Irene, vice-president, first district; J. Wilson, Groton, vice-president, second district; R. E. Cameron, White, district vice-president at large; executive committee —M. B. Ryan, Beresford; C. B. Miller, Egan; J. Wilson, Groton; and Theo. Holien, Sherman.

The next convention will be held at Sioux Falls on January 15 and 16, 1914.

Lebanon, Indiana, Repeals Franchises.

The Lebanon, Ind., city council, at a special meeting recently, appealed the ordinances under which the Lebanon Telephone Co. and the Central Union Telephone Co. have been operating in that city on the ground that these companies have failed to comply with the provisions of the franchises, requiring them to keep on file with the city an indemnifying bond as a protection against damages by the operation of their plants. The repealing ordinances are to become effective from the date of their filing, and the city is prepared for a fight in the courts.

A pending increase in rates precipitated the move by the council. A similar situation exists at Frankfort, Ind.

Federal Employes Form Telephone Association.

Recently 48 employes of the Federal Telephone and Telegraph Co. of Buffalo, N. Y., held a meeting in the assembly room of the General Electric Building, corner Genesee and Washington streets, Buffalo, and organized the Federal Telephone Association. All present signed the constitution presented and became charter members.

The association is for the mutual benefit of the employes of the Federal company. It is a "get-together, get-acquainted" club. Meetings will be held monthly, at which speakers, prominent in the telephone field, will give talks of vital interest on the business. Members of the association will also be called upon to give talks on that part of the telephone business in which they are engaged. In addition to this educational feature an entertainment committee will provide proper entertainment in the way of

luncheons, outings, etc., thus adding the important social feature to the association. The dues are placed at a nominal figure.

A. E. Brock, assistant manager of the commercial department of the Federal company (the prime mover in the organization of this association), called the meeting to order and acted as its chairman. The constitution was presented and adopted and the following officers elected: G. Barrett Rich, president; H. M. Dixon, vice president; Raymond Bissell, treasurer; Howard Sullivan, financial secretary; Guy Rogers, recording secretary.

The executive committee of the association will consist of the above offices, together with the chairmen of the membership, entertainment, grievance, by-laws and finance committees.

The date of the next meeting will be announced by the chairman of the entertainment committee. An invitation is to be extended to all male employes of the Federal company. It is expected that before the end of the first year the membership will have reached 300.

There can be no doubt as to the immense amount of good that will be derived by each member of an association of this nature. The interchange of ideas by those in the various departments cannot fail to be a potent factor in the upbuilding of the efficiency of each member. What a member gets out of an association is proportionate to what he puts into it and, judging from the interest shown at the initial meeting, it is safe to predict that the benefits which will accrue will greatly exceed expectations.

The first regular meeting of the new association following the organization was held a short time ago in the banquet room of the Genesee Hotel, in Buffalo. There were 88 present, which showed a growth in membership of 40. The dinner, which lasted from 7:30 to 8:45, was enlivened by popular songs, everybody present joining heartily in the singing.

G. Barrett Rich, Jr., president of the association, in well chosen words, expressed his appreciation of the honor of being elected to that office. After the reports of the chairmen of the various committees, short addresses were given by G. H. Raymond, of the Federal company; E. L. Grauel, assistant manager of the commercial department; and B. L. Moore, secretary and general manager of the Century Telephone Construction Co. Following these addresses H. M. Dixon, vice-president of the association, acted as toastmaster. In response to his call, Mr. Van Hook, of the P. B. X. maintenance department; W. J. Brock, of the Still Alarm Co.; Mr. Jewell, of the contract department, and others gave short but exceedingly interesting talks about their lines of endeavor.

Mr. Brock, who organized the association, gave an address in which he outlined the object and purposes of the association, in part as follows:

"The association was formed for the mutual benefit and advancement of the individuals connected with the Federal Telephone & Telegraph Co. and its associated and connecting companies—a real 'get-together' club for the promotion of good-fellowship among all employes of the company. It is social as well as educational. Speakers of prominence in the telephone field will be secured to address the members on the fundamental and serious side of the telephone business. Telephone men experienced in traffic, operation, maintenance and equipment will be secured to tell of the important things in these respective departments. There will be musical entertainments, banquets, outings and other good things provided by the entertainment committee.

"In addition to these features, plans are on foot to include a benefit in case of sickness or misfortune. Each member will be expected to give the association a talk on the telephone subject with which he is best acquainted and to put into the association his best endeavor. All of the funds going into the treasury of the association will be used for the entertainment and benefit of the members. An organization founded on these lines is bound to succeed."

After a rousing song the first regular meeting of the association was adjourned. The date of the next meeting will be announced later.

First Meeting of the Federal Telephone Association, Buffalo, the Organization of Employes of the Federal Company.

Practical Subjects—Letters and Discussions

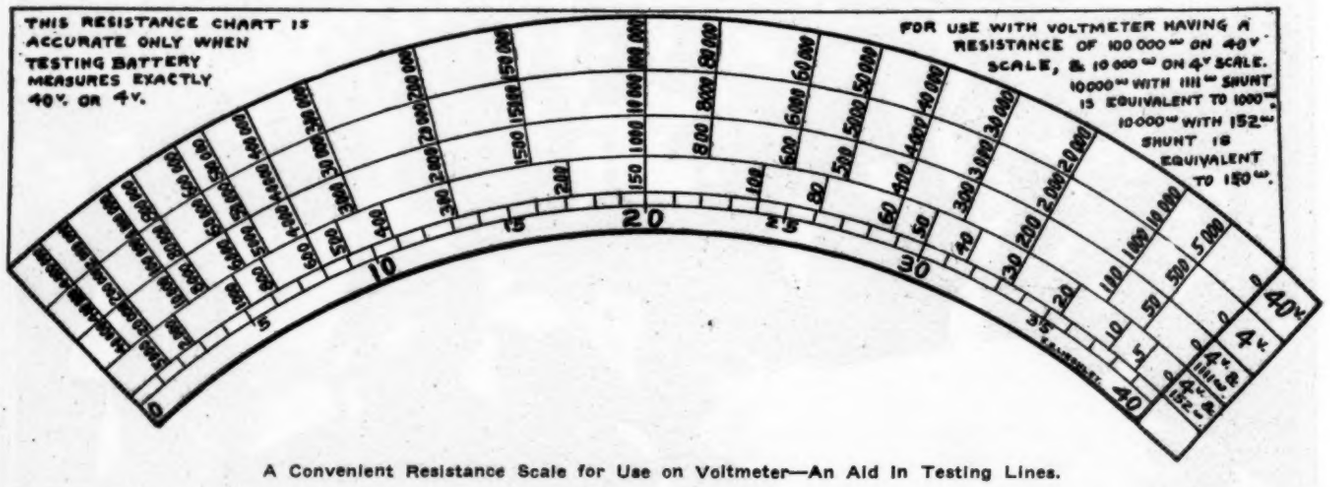
A Resistance of Scale for Voltmeters.

When testing lines with a voltmeter it is often desirable for a wire chief to know the resistance indicated by the voltmeter reading in order to locate the fault approximately, writes E. O. Leighley in The Telephone News. This is particularly true when using the shunts with the voltmeter for readings of faults having comparatively now resistance; it requires continual practice and observation for a testman to become familiar with what those readings mean, unless he has some tabulated resistance to which to refer.

When the resistances are given for each voltage reading, they become an endless lot of figures which the mind does not readily grasp; but by the arrangement shown on this chart they are given in round numbers and can be seen at a glance.

The chart shown is of a size to fit just above the voltmeter and shows the resistance in the circuit outside of the voltmeter itself when used with exactly 40 volts or 4 volts. The resistance indicated includes the internal resistance of the testing battery, as well as the resistance of the connecting cords.

A high-resistance voltmeter is much more sensitive to high resistance faults than is one of lower resistance.


THIS RESISTANCE CHART IS ACCURATE ONLY WHEN TESTING BATTERY MEASURES EXACTLY 40 V. OR 4 V.
FOR USE WITH VOLTMETER HAVING A RESISTANCE OF 100 000 Ω ON 40 V. SCALE, & 10 000 Ω ON 4 V. SCALE.
10000 Ω WITH 1111 Ω SHUNT IS EQUIVALENT TO 1000 Ω.
10000 Ω WITH 152 Ω SHUNT IS EQUIVALENT TO 150 Ω.

A Convenient Resistance Scale for Use on Voltmeter—An Aid in Testing Lines.

Thus (as is readily seen on the chart) a fault giving a 1-volt reading on the 10,000-ohm scale will give an 8-volt reading on the 100,000-ohm scale, and a troubleman would be sent to clear it. In this way the high-resistance instrument has a tendency to stimulate the wire chief to keep his lines more nearly clear.

The 10,000-ohm voltmeter with an 1,111-ohm shunt is equivalent to a 1,000-ohm voltmeter. (The same result could be obtained by using the 100,000-ohm voltmeter with a 1,010-ohm shunt, and only one testing battery would be required instead of 40-volt and 4-volt batteries.)

The 100,000-ohm scale is used for readings over 5,000 ohms resistance, or 38 volts; then by using the shunt the readings that would have been between 38 and 40 are spread out from 7 to 40, so the resistance at any reading is clearly shown.

Letters From a Retired Lineman to His Nephew.

Podunk Valley Farm.

Dear Ben:—

Your last letter has the right twang to it. For a while I thought you were affected something like the Dutchman Doc Stuver told me about.

Once there was a Dutchman who wasn't feeling O. K., so he went to a doctor. The doctor finally got the symptoms of his case and then asked him how much he ate each day. The Dutchman said he didn't eat much. He had breakfast at six o'clock, coffee, ham and eggs and several other things, anyway enough to require three cups of coffee to wash it all down.

Then at ten o'clock he went to Heine's saloon and had two schooners of beer and a half dozen sandwiches or so. At noon he went home and had a dinner of corned beef hash and cabbage or sauer kraut, coffee and a bottle of beer. Again at three o'clock, he went to Heine's and had the usual lunch of sandwiches and beer.

At six o'clock he had supper at home—roast meat, potatoes and all the trimmings; after supper a pipe and a bottle of beer on the back porch.

Then before going to bed at ten o'clock or so, he had sandwiches and a couple of bottles of beer. That was about what he ate every day.

The doctor told him he didn't need medicine and a doctor couldn't do anything for him, for nature had made a mistake in his case and given him but one stomach when he really needed two.

From the amount of knowledge about line building you professed to have acquired I was afraid nature had done the same by you and given you but one brain when you needed about three. You know a swollen head does not usually hold as much as one of normal size. One bumped and dented by adversity is the roomiest of all, because what is not shaken out of it, is of practical use.

You say you're glad they didn't let you build that wire crossing. I'm glad you see it was too big a job for you. But your admission that the general foreman knows more about the line building game than you ever expect to know, has the right ring to it. He must be all you say he is if he did that job with your gang of greenhorns in the face of all the bad weather and other difficulties you mention.

I was hoping they'd send just such a man. You wouldn't have learned much from one of the roaring kind. This man evidently knows his business, as you say he always had the men where they were needed at the right time. Am glad you had your gang sized up right, as was proven by the foreman selecting the men you would have chosen for certain parts of the work.

But now, Boy, don't try to ape his peculiar manner of

handling himself. Every man has his natural manner that he must allow to dominate his actions. You may think that you can move around the way he did, and say little; or stand on a stump, as he did, to direct the men. But ten chances to one you can't. It may be necessary for you to be on the tower, and then again if you set your heart upon standing on a stump, there may be no stump to stand on.

Act natural and you won't have to give that part of your conduct any thought. But if you try to remember just where this man was at each stage of the game, you'll have that much more to think about. You evidently made a good impression or he wouldn't be taking you along to do that submarine job.

I think they have a better method of handling work than formerly—much better. In my day river crossings, aerial or submarine, fell to the foreman who happened to be building that part of the line. I had experience in laying one submarine cable across the Mississippi. For the want of sound advice in the matter, the foreman directed the line to the narrowest part of the channel that he could reach conveniently. Then he got a tug and a scow and unreeled the cable into the stream.

The information has come to me since that where the Mississippi is narrow there is a good reason. It is that the channel is rock-bound. Well we dropped our cable but when tested it was badly crossed up, so we hauled it out on the reel again. It broke about halfway across and we lifted the other half by beginning at the other shore.

It was surely a nice looking piece of junk when we got it out. In the short time it was under water it had been cut by the rocks in a half dozen places and where it parted, it had been practically cut in two.

We got a new piece of cable and took a diagonal course across, the distance being at least a third greater. We couldn't change the starting point on account of the line being built that far, but we could continue from anywhere on the other side.

I understand that two or three years later this cable was taken up and replaced by one more than twice as long. On the advice of fishermen and others familiar with the river, it was laid in a trench near the shore, down stream a good half mile and then laid across on soft bottom and buried near the shore back to the line again.

The last year I was in the harness, this same cable went bad and I was one of the gang sent to raise it and make repairs. I didn't know the blamed thing had been moved and we spent the best part of a week fishing for it about where I thought we left it. Finally we trailed it along the shore, for in some places the sand had washed away and left it on top of the ground. We found it open in a clump of willows where it was exposed and some one cutting fish poles had taken a whack at it with an ax.

When you reach your job, you will probably find a surveyor there or stakes already set to indicate where the cable is to be laid, as well as charts showing the soundings and nature of the bottom.

If you pass this way why not induce your foreman to stop off with you for a day or two. I'd like to have a look at you, and Julia is anxious to have you see the kiddies.

I've sold your brindle calf, that is I butchered him and retailed him out by quarters at the market price, shipped the hide. He brought you $23.37. That is the result of your first $10 investment. The sheep I think will hold 'til spring. They're doing well and the market is not strong.

Am going down to a sale with Doc. Peters next Tuesday. Will probably invest your money in stock of some kind. Things will go cheap as very few have sold off much stock as yet and feed is going to be scarce before spring. It happens I have plenty of hay and corn. Pigs look good to me right now if they are the right size and the price not too high.

It wouldn't be a half bad idea to keep track of the best men in your gang. You can do more with men whom you know and besides you can't pick up business now as easily as you could ten years ago. It's well enough to know where you can get good men when you want them.

Our telephone company is at a stand still. My idea sounded too big to the prime movers. Think perhaps will compromise next week.

YOUR UNCLE DICK.

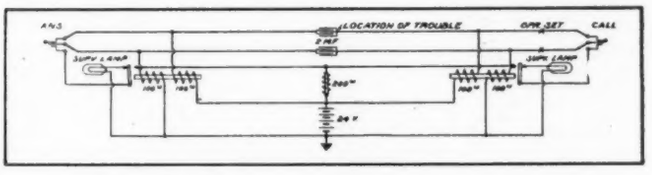
A Poor Connection Trouble.

A peculiar case of switchboard trouble which caused me quite a little annoyance before I located it, was that of a pair of cords on a common battery board which at times would not "talk up" well. By giving the board a sudden jar I could sometimes bring the trouble on. As I could always get battery on either plug and there seemed to be no scrape or cut-out, I decided that it must be a loose connection somewhere in the condenser leads.

Close inspection revealed nothing, so I removed the condensers to test them. They showed all right but in ringing through one of them I happened to notice a little spark at one of the terminals. The terminal was of the type where a small brass strip comes through and makes up on a ring of the clip.

This had not been soldered but had been painted over and made connection only part of the time. Soldering it and replacing the condensers cleared the trouble. The cord circuit is shown in the sketch.

Speaking of long-lived dry cells, I took out a pair the other day which had been in continual service since July, 1905. The subscriber had not complained even then of the telephone being "faint." But while changing the receiver cord that had been in the same length of time and was cutting-out, I thought it best to change the battery too, and save a trip later. I am sorry to say that we seldom find any of the more recently made cells holding up nearly as well. Whether good material is getting scarce or they can't afford to make them as good, I cannot say.



Circuit in Which Poor Condenser Connection Caused Trouble.

G. H. Pope,
Findlay, Ohio. Home Telo. Co.

Asks for a Discussion of Farm Line Contracts.

TELEPHONY is in receipt of a letter from a company in the Middle West, as follows:

"We would be pleased to hear from some of your large family on the question of connecting farm line contracts where they only switch the line for a stated sum.

You might get some discussion and very short form contracts, or perhaps you would kindly furnish us with the address of some company which has a large business of that type."

A discussion of this subject would probably be of interest to many of TELEPHONY's readers. Who will start the ball rolling?

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

U. S. Orders Private Wire Inquiry.

An investigation into the use of contract or leased telephone or telegraph wires at less than the published tariff has been ordered by the Interstate Commerce Commission. The Western Union, the Postal and the American Telephone & Telegraph companies are made respondents to the proceedings.

The order also includes the free use of contract wires by others than the contractors. The order for the investigation was made on complaint that the Western Union made contracts at less than the published tariff rate.

The order will have a far-reaching effect on the gathering of news and the handling of immense business by wire. It is doubtful, however, if the small question of an occasional use of a telephone will be taken up. It will affect the pooling of interests to have a wire under one name to be used by two or more parties.

It is also stated that there has been complaint that some leased wires were being used as transmitters of grain messages to secure the reduced rates.

British Telephone Settlement.

According to a cable dispatch from London, dated Jan. 13, the British government is to pay to the National Telephone Co. of the United Kingdom the sum of $62,576,320 for its property, according to a decision reached by the railway and canal commission sitting as a court of arbitration.

The whole of the telephone system in the British Isles passed into the hands of the state on Jan. 1, 1912.

The National Telephone Co. originally asked $105,000,000 for its interests, but during the 73-day trial just ended this claim was reduced by over forty-two millions.

The arbitration has been one of the most important in the history of England.

During the trial the parties came to an agreement as to the cost of the plant, the sum being $51,568,625. The court then had to decide the percentages, which should properly be added to that sum, and also the depreciation.

To Apportion $700,000 Chicago Reduction.

What might be called his semi-final report on telephone rates has been ordered from E. W. Bemis by the Chicago city council committee on gas, oil, and electric light.

He was instructed to make division of the $700,000 he says is the excess revenue of the Chicago Telephone Co. By determining the amounts to be allowed for proposed increases in wages and annual charges for the employes' pension fund and deducting them from this "surplus" he will arrive at the amount that may be used in the reduction of rates.

In addition to this he was instructed to present to the committee a statement on the several kinds of telephone service—business, residence, etc.—showing which classes are profitable and which are operated at a loss. With these figures before it the committee believes it can outline how the amount available for reductions should be applied to the several kinds of service.

Prof. Bemis also was ordered to present to the committee a report on the arguments for and against the "nickel-first" device, the possibility of the installation of telephone meters, the advisability of creating a neighborhood exchange in Edison park, and the request of the board of education for free service from the schools throughout the city to its downtown offices.

It was estimated the report should be ready in two weeks and that the committee may complete its labors on this problem in another week or two.

Buys Bell Exchange in Ohio.

The Ohio Public Service Commission, of Ohio, has authorized the Union County Telephone Co. to issue $20,000 of its capital stock. Of this amount $3,000 is to be expended in the purchase of the Central Union (Bell) Company's Marysville exchange, and the balance is to be spent in extensions and betterments of the company's property.

Important Rate Ruling in New Jersey.

On the ground that the rates of the Delaware & Atlantic Telephone & Telegraph Co. in the Camden district, as a whole, cannot be assailed as unjust or unreasonable, the New Jersey board of Public Utility Commissioners has dismissed the complaint against the company filed by some 23 of the largest commercial, manufacturing and banking houses in the city of Camden and in which the Camden county board of freeholders joined.

The state board rules that the petitions, so far as alleging extortionate or undue rates, were not well founded. The original complaint was filed by Gately & Hurley, of Camden, and the other business houses subsequently joined. The freeholders of Camden county, whose contract for service in the Sheriff's office had been superseded by an increased rate, complained upon similar grounds and added a charge of discrimination against the county and in favor of Camden. The freeholders charge that the city government continued to enjoy more favorable rates than the sheriff's office.

The decision against the telephone users in the Camden district is important because of the bearing it may have in other parts of the state. The same company, which is a part of the "Bell system," has served notice of an increase in rates in the Trenton District, against which a protest has been filed with the commission and the matter is now pending.

Until May, 1911, the Camden complainants obtained service under contracts which allowed unlimited telephone use to Camden and the neighboring places within a ten mile radius, and also to Philadelphia for a flat rate of approximately $150 a year. About that time the company notified the complainants that it was unwilling longer to provide service under the contracts and offered superseding contracts which materially increased the price of service. The complainants then brought the matter before the state commission, claiming that the new rates were unjust and unreasonable; that it was intended by the change in rate to augment unduly the revenues of the company; that the company refused to establish reasonable classifications of service, as between large and small users of the telephone, and as between measured and unmeasured service outside of the Camden city limits.

It was further charged that the company discriminated against the complainants in not terminating simultaneously all contracts similar to those formerly enjoyed by them.

In compliance with the request of the company, the

voluminous testimony taken covered not only the complainants but all patrons in the entire territory of the company in the state. This indicates the important bearing the decision may have throughout New Jersey.

While dismissing the complaints, the state board denies the claim of the company to a margin of profit equal to 10 per cent. On this point the board says:

"A return of 8 per cent. on the fair present value of the company's investment seems to us fairly equitable, when consideration of all conditions is taken. Especially as this return is to cover all such items as bank discount, brokerage or other costs of obtaining capital. The technical apparatus is still in process of change. The proper allowance for depreciation is still, of necessity, largely conjectural. Moreover, so far as this particular company is concerned, brisk competition is still offered in many parts of its territory.

An 8 per cent. annual return for profit upon $5,338,000 (taken as the fair present value of the company's investment) is $427,040. The earnings and expenses indicate that in 1908 the corporate deficit was augmented by $198,085.56; in 1909, by $43,123.97; that the net earnings for 1910 were $160,756.32 and for 1911 they were $170,196.13. The disparity between the actual present earnings and a return of $437,040 is so large that it is not necessary to consider in detail whether the company's estimate of earnings should not be somewhat reduced by reason of the royalty paid to the parent company; by reason of possible excessive prices paid to the Western Electric Co. for supplies; by reason of possible inclusion in operating charges or overhead charges that should be deducted because of the intrusion of similar items in the capitalized estimate of various parts of the plant, and by reason of estimated appreciation of parts of its property. The net profits at present are clearly not excessive, but demonstrably moderate so far as this comany is concerned. It follows that its rates as a whole cannot be assailed as unjust or unreasonable.

The company claimed the 10 per cent. profit margin only until such time as a surplus should be accumulated that would assure a regular 8 per cent. margin of profit. The board says it is of the opinion that the addition of 2 per cent. is not warranted even temporarily. "One purpose of an adequate depreciation allowance," declares the board, "is to secure this very uniformity of net profits which the company desires to put beyond hazard. Where adequate provision is made for annual depreciation, unusual outlay in a given year for replacements is taken care of without necessitating a drop in dividends."

The ruling of the board is that Gately & Hurley have long enjoyed a rate which was so low as to be discriminatory. The board further says that of the 23 complainants joined with Gately & Hurley, the First National Bank of Camden is the only one which has presented specific facts with reference to its use of a telephone under its contract now superseded. It finds that no unjust discrimination is practiced against the Board of freeholders and in favor of the city government, because the rates of the city were in return for privileges granted by the city. The board states that it has no control over rates for service in Philadelphia, this being interstate service.

New York Bell Reduces Jersey Rates.

The New York Telephone Co. has filed with the New Jersey Board of Public Utility Commissioners a schedule of rates containing a number of reductions in its charges for telephone service in North Jersey. It is estimated that the new schedule will result in a gross reduction of about $67,000 annually, based on the number of telephones now in use. The filing of the schedule grew out of the investigation of the rates charged by the Delaware & Atlantic Telephone and Telegraph Co. A comparison of the rates in North Jersey with those in South Jersey showed that the former were higher.

The commission announces that it has decided to permit the new schedule to go into effect with the understanding that this will not in any way prevent the board from ruling hereafter on particular parts of the schedule should the justice and reasonableness of it be challenged, or should it appear to the Board that changes should be made.

Mountain Home Files $2,000,000 Mortgage.

The Mountain Home Telephone Co., which recently was authorized by the New York Public Service Commission to take over the properties of a number of Independent telephone companies in northern New York State, as well as those of the New York Bell in the same territory, has just filed a mortgage for $2,000,000. This is to secure a bond issue for an equal amount. The bonds will be utilized in securing the systems which are to be merged under the Mountain Home name and organization.

The bonds are 5 per cent., general mortgage, interest payable semi-annually. The mortgage was issued to the Columbia-Knickerbocker Trust Co., of Plattsburgh.

The present officers of the company are: President, I. H. Griswold, Albany; vice-president, A. K. Bottsford, Saranac Lake; secretary and treasurer, G. H. Rymers, Plattsburgh; general manager, John P. Boylan, Plattsburgh.

Refuses to Order Pay Station Installed.

The New York Public Service Commission has dismissed the complaint of Alfred H. Weston, of Brooklyn, against the New York Telephone Co. asking that a pay station be installed at an office building at No. 2950 Fulton street. The resolution of the commission recites that testimony produced on the hearing did not indicate any substantial public demand for the installation of an additional public pay station upon the premises as there are already a number of such stations in the immediate vicinity of complainant's office.

Penalty for Tree Cutting.

The American Telephone & Telegraph Co. has paid the New York Conservation Commission $1,250 in settlement of the action for damages and penalty due to a trespass on state lands in the town of Keene, Essex county, N. Y. In rebuilding its line from Elizabethtown to Keene Center, the telephone company cut 1,056 trees of an estimated value of $42.38. The payment received from the defendant corporation is more than three times the value of the timber cut plus a penalty of $1 a tree. Only 245 trees were six inches and upwards in diameter.

New York Commission Adjusts Toll Rates.

The New York Public Service Commission has closed upon its records the complaint of J. H. VanDuzer & Co., of Newburgh, against the New York Telephone Co. as to toll rates between Newburgh and Tuxedo. The present charge is 25 cents. Commencing February first, the commission has arranged for a rate of 15 cents for a three-minute two-number rate and 20 cents for a three-minute particular person rate.

Asks Revision of Inter-Connection Ruling.

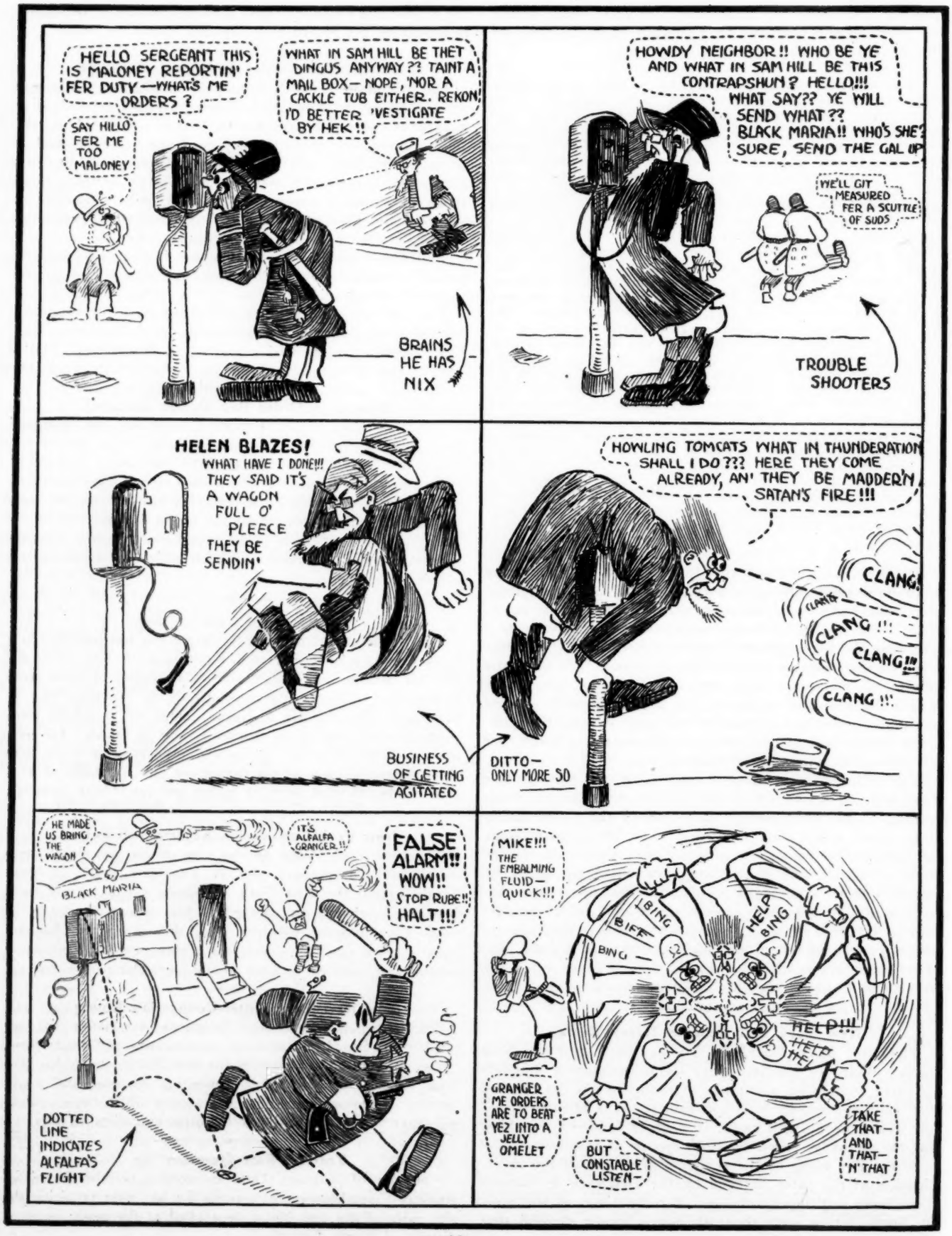
The Canadian Independent Telephone Association has applied to the Board of Railway Commissioners of Canada for a revision of its order requiring the Bell Telephone Co. to give long distance connections to competing systems, and a reduction of the originating fee of 15 cents which those companies have to pay, in addition to the usual long distance tolls.

Toronto Rate Question Up.

The city of Toronto, Ont., is applying to the Board of Railway Commissioners of Canada for an order requiring the city rates of $50 and $30 to be applied to the newly annexed district of North Toronto.

Alfalfa Granger vs. Police Box

Words and Music by W. L. Capple


HELLO SERGEANT THIS IS MALONEY REPORTIN' FER DUTY—WHAT'S ME ORDERS ?
SAY HILLO FER ME TOO MALONEY
WHAT IN SAM HILL BE THET DINGUS ANYWAY ?? TAINT A MAIL BOX— NOPE, 'NOR A CACKLE TUB EITHER. REKON I'D BETTER 'VESTIGATE BY HEK !!
BRAINS HE HAS NIX
HOWDY NEIGHBOR !! WHO BE YE AND WHAT IN SAM HILL BE THIS CONTRAPSHUN ? HELLO!!! WHAT SAY?? YE WILL SEND WHAT ?? BLACK MARIA!! WHO'S SHE? SURE, SEND THE GAL UP
WE'LL GIT MEASURED FER A SCUTTLE OF SUDS
TROUBLE SHOOTERS
HELEN BLAZES!
WHAT HAVE I DONE!!! THEY SAID IT'S A WAGON FULL O' PLEECE THEY BE SENDIN'
BUSINESS OF GETTING AGITATED
HOWLING TOMCATS WHAT IN THUNDERATION SHALL I DO ??? HERE THEY COME ALREADY, AN' THEY BE MADDER'N SATAN'S FIRE !!!
CLANG!
CLANG !!!
CLANG!!!
CLANG !!!
DITTO— ONLY MORE SO
HE MADE US BRING THE WAGON
BLACK MARIA
IT'S ALFALFA GRANGER !!!
FALSE ALARM!! WOW!! STOP RUBE!! HALT!!!
DOTTED LINE INDICATES ALFALFA'S FLIGHT
MIKE!!! THE EMBALMING FLUID— QUICK!!!
BING
BIFF
BING
HELP
BING
HELP!!!
HELP ME!
GRANGER ME ORDERS ARE TO BEAT YEZ INTO A JELLY OMELET
BUT CONSTABLE LISTEN—
TAKE THAT— AND THAT— 'N' THAT

Texas Independents Discuss Live Operating Questions

Abstract of Three Papers Delivered at Recent Annual Convention of Texas Independent Association—Buford Adams on Toll Development; W. K. McQuown on Central Office Discipline; and J. M. Henshaw on the Handling of Through Telepone Calls

Toll Line Development.

The question of toll line development is not only a question of first importance to the manager of the small local exchange and the larger system, but it is also of vital importance to the investor. Therefore, I will discuss the subject not only from their standpoint, but also from the user's standpoint.

I will first mention some of the new and additional lines that have been recently, and are now being constructed.

In North Texas the Union Telephone Co. has just recently finished a line from Dallas to Sherman and from McKinley to Greenville, connecting at these places with other lines, which have already been in use some time, but giving them direct service into Dallas and intermediate points.

The Brazos Valley Telegraph & Telephone Co. is now constructing a line along the M., K. & T. right-of-way from Waco to Dallas, consisting of six No. 10 metallic copper circuits. This line, when completed, will set the pace for a new standard in Independent telephone construction in Texas, we having used a great deal of care in specifying the best material obtainable for the construction of this line. We have also just completed an additional copper circuit from Waco to McGregor, and recently constructed a new line of two No. 10 copper and two No. 12 iron circuits from Waco to Marlin.

The Martin Telephone Co. also has recently built a No. 10 copper circuit from Austin to Llano, a distance of about 80 miles. There are also many short lines being constructed and additional circuits strung in, too numerous to mention.

The building of the Dallas and Houston exchanges has given long distance development a distinct forward movement and, from present indications, this is likely to continue. It has given the investor an opportunity to originate and terminate long distance business, which he did not have before these exchanges were built, and has given a chance for the Independents to compete with the Southwestern Bell. Therefore, we are able to say to the money powers that we believe we can make a profit on our investments.

We may reasonably say that the Independent system through the black belt of Texas has added during the year 1912 not less than 1,000 metallic miles of copper wire, but in order to make sure of the continuance of this development, it becomes necessary to thoroughly demonstrate the earning capacity of the present lines, and to create a necessity for new and additional lines.

Value of Efficient Toll Lines.

I cannot emphasize too strongly the fact that we must make money out of long distance lines, or we cannot keep building them. See that all calls are properly checked and collected for. Do not load up the lines with "dead-head" calls. Cut them out; better, write letters, if possible. See that the lines are available for business calls; report trouble to the proper authority as soon as it shows up. Always be ready and willing to make a toll line test. It helps to pay big dividends to both local and long distance companies.

Toll lines should be kept as free from trouble as possible by inspection and by anticipating trouble and keeping it down to a minimum, and when trouble does show up every effort should be exerted to remove it as quickly as possible.

Then, too, the operators should be impressed with the idea of no lost calls, and the necessity of grouping calls so as to handle the largest number in the least amount of time, and with the least amount of friction. Operators should also learn to give and take and not to consider that they have superior or better rights than other operators. If the operators over the entire system could be impressed with the idea of all working to get through the largest number of calls, it would wonderfully increase the earning value of the lines, and thereby not only increase the business, but open up the way for new investment and more long distance development.

Changes in Routing of Toll Lines.

While we ought to continually keep in mind the best methods of constructing, maintaining, operating and revenue producing, we should never lose sight of the fact that, with all of this, we shall fail if we overlook the public. The public has certain rights invested in every public service corporation, and every effort should be made to please and satisfy every individual patron, not only by good and efficient service, but by the magic use of tact and courtesy, from operators and managers alike. If this is done we shall make the Independent system the "talking system."

There is one phase of toll line development that should be considered carefully, as I believe there will probably be a departure from the present method of building along railroads to the county road or public highway in the near future.

The increasing use of the automobile and motorcycle is causing the bad roads of Texas to rapidly disappear, and a fine system of pike roads is rapidly approaching. This same mode of locomotion makes it desirable to build toll lines along the public road where they can more readily and quickly be inspected and repaired. It is also an open question as to which offers the cheaper line of construction.

Another very important item in toll line development is to, at the very outset, so engineer and build that your lines will be available for phantom work. In this connection, it is advisable that when toll lines enter the exchange building through cables, it should be done through a special cable made up for phantom work, and the wires should be of sufficient size to not appreciably cut down the efficiency of the line. However, as a general proposition, it is not advisable to place toll lines in cables.

If you have a toll line, keep it up. See that there are no bad and defective joints. See that it is properly insulated and free from close proximity to foreign wires and grounds. See if the service over it cannot be improved. Ever so little helps on a long call.

If you have only one circuit on a pole line, do not expect it to pay a large dividend. If you have two circuits and enough business for them on the same lead, they will pay better. So with each additional circuit, if the traffic is sufficient, as each additional circuit cuts down the pole line cost per circuit. If you haven't any toll lines, now is the time to begin. It pays others, why not you?

In conclusion, I want to call your attention to the all

important fact of good construction. The Independents have spent entirely too much money experimenting with untried material, and in cheap and sorry construction. This all turns out to be extravagant and expensive. For approved methods, start right, do standard work, and with the present solid footing of Independent telephony in Texas, and modern methods, you can't lose on long distance development.

Central Office Discipline.

It is generally conceded that the operating room offers one of the most important problems that confronts the telephone manager in his struggle to give service that is satisfactory to the public. And the human element—the operating force—is the factor that, in the end, determines the result of the struggle.

A courteous, obliging, efficient force of operators can, and often does, give excellent service with very low grade apparatus. On the other hand, a force of careless, impudent girls can set at naught the best efforts of the manufacturer and construction man. So it surely behooves us to put our best efforts into the proper selection, training and government of the young women who are to make or mar the future of our business.

Qualifications of an Operator.

The first thing we must consider is the applicant for the position as student. There are many qualifications necessary to the good operator that may be discovered in the applicant, and they should be carefully considered before choosing the student from the list of applicants. The student should be a bright, intelligent young woman, preferably between the ages of 16 and 21, neat in personal appearance, apparently with a good disposition, able to write a good hand, and having no defect in speech, hearing or eyesight. If, in addition, she has a high school education, she will be an ideal applicant. In this connection, it is a noticeable fact that the high school graduates in a large force of operators usually hold the best positions.

The young woman answering the above description will ordinarily be an apt student, amenable to discipline, and, if properly governed, will make a first-class operator. Having a force of operators possessing these general qualifications, it only remains to devise proper means for governing them, to insure the result for which we are working—uniform good service.

The operator of average intelligence can be depended upon under ordinary conditions to follow instructions as she understands them, and it is the duty of the superintendent of operation to devise a clear, concise set of operating rules and instructions and to see that all beginners are made to understand all details. Quite often a thorough investigation of some offense will disclose the fact that the trouble is the result of ignorance of some detail on the part of the offender. It is good policy to have the rules re-read occasionally, even by the older operators. Every effort should be made to insure the operators knowing just what is expected of them.

After this is accomplished, bearing in mind that self-interest is the main spring of most human endeavor, we should consider some plan to induce the operator to put forth her best efforts *for her own personal benefit,* as well as because of her duty to her position. Perhaps the best way of accomplishing this is by what is known as the merit system.

This plan can be applied to any exchange that is large enough to have a chief operator. It requires only a daily report from the chief operator and each supervisor and a separate page for each operator in a record book. The general idea of the system is that each operator starts each month with a clear record, and her record remains clear throughout the month unless she violates some rule. When she does this, she is charged with a certain number of demerits, according to a pre-arranged schedule, and at the end of each month the various offenses and the demerits charged for each offense are posted to her page in the record book. When any advancements in salary or position are to be made, the record book is brought into play and action is gauged by the history it records.

It is plainly to be seen that the success of this system depends very largely upon the judgment of the chief operator in charging demerits. The superintendent must carefull investigate all offenses, and see that justice is rendered and the entire operating force must thoroughly understand the effect of demerits, so that they will govern their conduct accordingly.

This system accomplishes in a practical way a permanent record of the daily discipline in the operating room. The value of this record in its various applications is very great. A rule may be made that no operator's salary may be raised unless the past three months show less than ten demerits each month. An operator who has twenty-five demerits in one month may be reduced in salary and, if her record is not improved in the following month, she may be dischcarged.

In fact, the applications that may be made are endleess, and subject only to the demands of local conditions. The system may be readily adapted to the very large or the very small exchange. In the large exchange each operator's record should indicate her personal history as set forth in her written application, a record of all service tests made on her work and anything else demanded by conditions on the exchange.

It may seem to one who has never tried it that this method of disciplining operators involves too much so-called "system," but in practice it may be worked out very simply and with very little expense. And, if proper judgment is exercised in its application, the results will be very gratifying.

Handling Through Calls.

To prevent any possible vagueness, I shall at the outset define a through call as one which is switched at one or more stations between the originating and terminating points. It always involves three or more operators, three or more switchboards and two or more circuits. It, oftener than any other call, puts your transmission efficiency to the test and demands the utmost of your switching equipment. It represents the peak of the distance load, if I may use the phrase.

Through calls at any exchange are relatively few in number, and perhaps for that reason they escape the attention they deserve. That they do require especial attention is evidenced by the two related qualities they possess, which just a little investigation will discover. First, their operating cost per minute is higher than for direct calls. Second, their revenue per minute mile is never more and is often less than on direct calls. Put epigrammatically, the through call costs more and pays less. As we cannot escape the through call the question naturally arises, how shall we handle it so as to keep safely between the two horns of the dilemma?

Suggestions, Operating Methods.

Given the equipment making through calls mechanically possible, there is only one way to handle them economically, and that is to use such operating methods as will complete them with the minimum of delay. All companies, having through connections over each other's lines, should agree on and practice persistently a standard method. As a basis for such a system, I submit a few suggestions.

To begin with, the recording operator should make her through ticket details so complete that there will be no need of call-backs for additional information.

Line operators should pass through calls by asking for the terminating stations, instead of for the next point from the first intermediate station. This, so that all operators concerned will be aware of the correct nature of the call, and will know the terminating as well as the originating station. A Waco-San Antonio call switched at Temple, Taylor and Austin, should be given to Temple, Taylor and Austin by Waco by saying in each instance, "San Antonio for Waco." Intermediate operators should stay in on connections after ringing the next station, until that station answers, and after that should supervise at from three to five-minute intervals.

The originating station should never ring on a tandem connection after it has begun to be built up, for the reason that her ring will be mistaken for a ring-off signal by some intermediate station and the connection interrupted.

The originating station should never leave the connection while the circuit is being built up, as intermediate operators will take down connection on getting no response to their supervision. After getting in communication with the terminating station, originating operator should pass call and get her first report or her party, before leaving the line. After getting the report or completing the call, both the originating and terminating operators should ring out on the line and order the circuits released.

Line and intermediate operators should always use copper circuits for through business, and should avoid the use of iron or local circuits having bridged stations.

Operators should be taught that through business is an expense, unless promptly handled, and that delayed through calls always cause delay to direct calls by needessly monopolizing circuits. It is natural that operators should desire to get their own calls up at the expense of through calls, but it is bad practice to do so, and only intelligent education of the operators will show them the matter in the different but correct light.

To summarize: The through call, though an inconspicuous item in the traffic bulk of any exchange, is a vitally important one, and neglect of it means not only a failure to get profit, but also an actual expense in circuit and operators' time lost. Promptness in handling it is the only safeguard against loss. Proper handling will come only of trained operators, and trained operators will be the result of intelligent education from managers who realize the importance of this, to some extent neglected, feature of the traffic work.

The Telephone Inspector and the Troubleman

Continuation of a Series of Articles Begun in the September 7 Issue of Telephony—They Deal in an Elementary and Explicit Manner With Many of the Problems Encountered by Telephone Men in the Operation of Small Exchanges

By A. E. Dobbs

We need not go over the work of the next few weeks, as it does not strictly belong to this story, except to say that corner poles, which had been held with only one strand of No. 8 wire, were firmly anchored with guy strand several times as strong. Where the guy was fastened to a stub, an anchor was added to hold that. The month's work of a general going over of the lines as originally estimated, lengthened out to nearly three months before it was finished, and then nothing short of a tornado and sleet storm combined could have made any great amount of trouble.

About this time Johnson was called upon to take charge of some work in another town, and Will, when there was nothing else to do was put to work in the back shop rewiring telephones. As to George, there was still a great deal that required his attention, for there were more than 100 miles of toll lines and two other small exchanges to look after.

William Learns Something of Instrument Work.

"Now," said George, one morning to Will, "here we have a lot of worn-out or rather played-out instruments, which we will make over first. Then we will take them out and exchange them for some others that are not giving satisfactory service, and in this way will gradually get all the instruments brought up-to-date.

"We have many different makes of telephones, and while the wiring of them is very similar in practice, yet the various sets are so arranged that it is hard to apply a simple diagram unless familiar with them.

"Then, you see, some of them have the transmitter on the generator box, some in a separate box or on an arm between the magneto and the battery box. Some have induction coils in the box alongside of the transmitter, some in the box above, and others in the battery box.

"Some of these generators are quite different in the arrangement of their shunt circuits, there being two kinds, which we will call the closed and open shunts. Now let us begin with the primary circuit. Tell me what is in it, to see if you remember it?"

"The battery, transmitter, primary coil and switch," answered Will.

"Good. Now, can you tell me the ringer circuit?" again questioned George.

"That includes the ringer, coils, the down contact of the switch, the switch bar itself and the generator."

"Yes," said George, "but the generator is only included in circuit when it rings in; do not forget that."

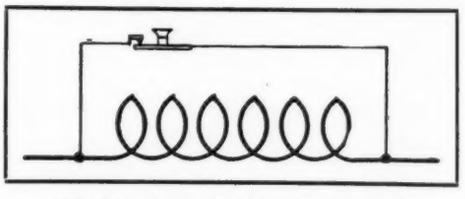


Fig. 39. Coil with Shunt Around It.

"How is that?" asked Will. "I see that the wire comes to the generator magnets and out at the end of the coil."

"Well, that generator has a shunt around the coil, even if you do not notice it."

"What is this shunt?" queried Will.

About Generator Shunts.

"A shunt," replied George, drawing a sketch, "is a second path or bridge around an instrument. In this sketch, (Fig. 39), the shunt is simply a short piece of wire around the coil, which having a low resistance, takes nearly all of the current. In some cases the shunt may be a low resistance coil around

another of high resistance, but in any case it means an additional path for the current to travel over. The current will take the easiest path, or at least most of it will, for if one path had a resistance of 100 ohms and the other a resistance of 10 ohms, the latter would take ten times as much current as the former, but each one would get its share.

"Now, with a telephone generator the resistance and im-

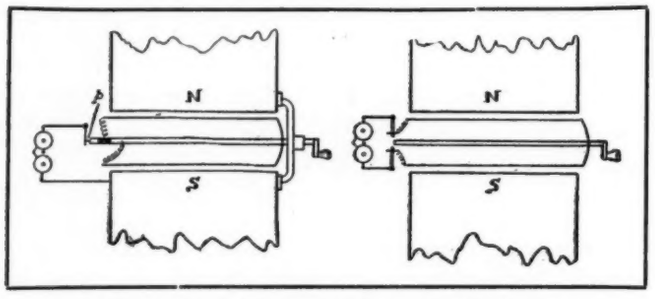


Fig. 40. Armature Connections to Bell Circuit.

pedance of the armature coil would interfere with the working of the bells, so it is cut out by a shunt. The majority of these shunts are a closed circuit around the armature, which is broken when the handle is pushed in, but there are some devices in which the generator circuit is left normally open while the current goes around in another way.

"A device which was commonly used consisted of a hollow wheel on the end of the armature shaft. It was half full of copper filings, which, while at rest, short-circuited the contact pin with the shaft. But when revolved rapidly the copper filings flew away from the armature shaft, and allowed the current to go to the line. That was a closed shunt.

"Do you want to know how the shaft can short-circuit an armature? There you have it," said George, pointing to an armature from which the wire had been removed. "Examine the shaft end and you will see the pin marked *p* in the sketch Fig. 40 in the end to which one wire of this coil is connected. You notice that the end of the shaft is hollow, and that the pin sets in a bushing of hard fiber or rubber, which keeps it from touching the shaft. If you examine the coil closely, you will find the other end of it connected directly to the shaft, and through the shaft, of course, to the generator frame. See the point? Now, as this dynamo coil revolves, currents are set up in it by the magnets *N* and *S*, but every time the coil turns over, the currents in the two sides are reversed, first in one direction and then in the other, and the bells respond in the same way.

"Why did I call it a dynamo coil? Because there is no difference in principle between that little dynamo and the big ones down at the power house. Of course, this generator has only one coil while those have several hundred, but that is merely a question of power and character of current required.

"Then the field magnets of those big ones have coils around them and are energized by current from their own armatures, while with the little ones we can use permanent steel magnets, though dynamos of several horsepower have been built with permanent magnets. Now, if you will look at this sketch on the right (Fig. 40), you will notice that the coil is connected in a manner differing from the other one on the left. Here you see the ends of the coil are brought out to bars and connection made to the circuit through brushes of copper. You can now see the resemblance between the little dynamo and the big one.

"The current in the armature is reversed in this case the same as in the other; but see, when the armature is turned over, it connects to the other side as well, so that the current always goes out on the line in the same direction instead of being reversed every turn of the coil. This is what we call a direct current generator, and on account of sending its current continuously in one direction, it cannot ring the ordinary polarized bell, except to draw it to one side and hold it there. For this reason it is sometimes used on party lines where the subscriber ringing up the office will ring no one else on the line, as the armature is held to one side by a spring and can only be rung by an alternating current or a direct current reversed from the central office. In connecting up a generator of this kind, you must, therefore, connect the line to the same side as that to which the spring is held, as otherwise it will ring the bells of other subscribers.

"But this is getting away from our subject. Where was I at? Oh yes! When there is a short circuit in your armature it is very likely to be in that center pin in the end of the shaft. In that case, the bells will ring from the office, but, while the generator turns hard, you cannot ring either the bells or the office. This would also happen if the shunt coil should not spring open when the handle turns as it sometimes does. If, however, your coils should be 'open,' the handle would turn easily, but there would be no current, although if the shunt is all right, the bells can easily be rung from central.

"On the other hand, if the ringer coils should be open, you could not ring central or be rung from there. If you could get them in any way, you could talk over the line as well as ever, and also, by taking the telephone off the hook you can get the line induction. In order to test this, place one finger on the generator frame and the other on the spring at the end of the shaft; then by turning the handle you can feel the current, and by moving your fingers up to the bells, you can tell whether the current passes the coils or not."

"Speaking of ignorant telephone men," George remarked, after Will had told of some things he had heard had been done, "I know of a manager up in Michigan who complained to the manufacturers of his apparatus that his induction coils were not made right, because he had cross talk in his lines."

George Has Some Fault to Find.

"Yes, that is a fact, though I could not believe it when I first heard it, but my experience with some of these new men would lead me to believe anything of them. Some of them think that any farmer can build a telephone exchange and run it after it is built. I have been in the business a great many years and have seen all kinds of exchanges built and all kinds of experiments tried. I have built a goodly number myself, but although I have studied hard and consider myself well up to date, there are many things yet that I don't know. How, then, would it be in the case of a man who has followed the banking or grocery or law business all his life? Of course, manufacturers who sell them the instruments, try to advise correctly as to the proper thing to do. Sometimes they have the sense to employ some one who can handle the work for them, but even then they often hamper him with orders and suggestions until the poor fellow gets into the habit of letting things drift, or else quits in disgust."

George had a disposition to grumble sometimes in a way which conveyed the impression that his work had been hampered and criticised by men who did not know as much about it as he did. Some men have no patience with those who do not know as much as themselves, especially if the ignorant ones are disposed to be assertive in direct proportion to their lack of knowledge, as is generally the case.

(To be continued.)

Indiana Independent Expands.

The Rochester (Ind.) Telephone Co. has increased its capital stock to $50,000. It is proposed to build a new exchange and to greatly extend the underground plant. The officers of the company are: H. A. Barnhart, president; L. M. Brackett, vice president; Daniel Agnew, secretary, treasurer and general manager; Tully Pontious, superintendent.

Uniform Accounting System of Interstate Commission

Complete Details of Plan Promulgated by Government Body for Use of Every Telephone Company Having Annual Income of Upwards of $50,000—Plan for Smaller Concerns is Now Under Contemplation—System Effective Universally January 1, 1913

122. MATERIALS AND SUPPLIES.—This account should include the cost of unapplied material, including the value of material temporarily in use and not charged out in the company's accounts; articles in process of manufacture by the company; tools, fuel, stationery, and other supplies. Freight and express charges paid on material included in this account should be included in the value of such material.

Where discounts recovered through prompt payment can not be credited to the particular bills, the cost at which such materials and supplies should be charged should be the invoice cost, and any discounts recovered through prompt payment of bills for such materials and supplies should be credited to clearing account No. 704, "Supply Expense."

When any tangible fixed capital is discontinued, withdrawn, or retired, and when any equipment, materials, and supplies are returned to store, the salvage value thereof should be charged to this account, regardless of whether such equipment, materials, and supplies are to be consumed in operation or in construction, or to be sold. If such value is not known and cannot readily be determined, it should be estimated, and errors in such estimates, when determined, involved during the year in which the estimates were made, should be adjusted through the accounts involved; if later, then through the Corporate Surplus or Deficit account.

Inventories of materials and supplies on hand and unapplied should be taken at least annually, and any shortages or overcharges disclosed by such inventories should be credited or debited to this account and debited or credited to clearing account No. 704, "Supply Expense," in case such shortages or overages can not be assigned to specific accounts.

123. OTHER CURRENT ACCOUNTS.—This account should include the cost of all current assets which are not includible under any of the foregoing accounts. By current assets are meant only those things that are readily convertible into money and which are held not as investments but with the intent of being presently converted into money.

ACCRUED INCOME NOT DUE.

124. UNMATURED INTEREST, DIVIDENDS, AND RENTS RECEIVABLE.—This account should include the amount of interest on loans made and rents under leases accrued to the date of the balance sheet, but not due or collectible until after that date, and dividends declared on stocks owned, and dividends accrued on such stocks when contracts require that the dividends be paid at stated times.

DEFERRED DEBIT ITEMS.

125. SINKING FUND ASSETS.—This account should include the amount of cash, the cost of book value of live securities of other companies, the par value of live securities issued or assumed by the accounting company, and other assets which are in the hands of trustees of sinking and other funds for the purpose of redeeming outstanding obligations; also amounts deposited with such trustees on account of mortgaged property sold. A separate account should be raised for each sinking fund.

In stating this account on the balance-sheet statement the par value of any securities issued or assumed by the company and carried in this account should be deducted from the total in order to show only the net assets in the funds other than the company's own securities. (See sec. 5.)

126. INSURANCE AND OTHER RESERVE FUND ASSETS.—This account should include the amount of cash, the cost or book value of securities of other companies, the par value of securities issued or assumed by the accounting company, and other assets in the hands of trustees or managers of insurance, and other funds that have been raised and specifically set aside or invested by the company for specific purposes (except special deposits, provident funds, and sinking funds for the retirement of obligations). A separate account should be raised for each fund.

In stating this account on the balance-sheet statement the par value of any securities issued or assumed by the company and carried in this account should be deducted from the total in order to show only the net assets in the funds other than the company's own securities. (See sec. 5.)

127. PROVIDENT FUND ASSETS.—This account should include the amount of cash, and the cost or book value of securities and other assets in the hands of trustees or managers of employes' pension funds, savings funds, relief, hospital, and other association funds (whether contributed by the company, by employes, or by others), when such trustees or managers are acting for the company in the administration of such funds. (See account No. 170.)

128. PREPAYMENTS.—This account should include the balances arising from the payment of rents, taxes, insurance, and like disbursements, in advance of the period to which they pertain, as defined in the following subaccounts:

129. *Prepaid Rents.*—This account should include the amount of rents paid in advance of the enjoyment of the term. As the term is consumed, credit this account at monthly intervals and debit the appropriate rent account with the amount applicable to the month.

130. *Prepaid Taxes.*—This account should include the excess of taxes paid over the amount properly chargeable to Income or other accounts as shown by the debit balance in the Tax Liability account. (See sec. 16.)

131. *Prepaid Insurance.*—When premiums on insurance policies are paid in advance of their accrual, the amount prepaid shall be charged to this account. As such premiums accrue, they should be credited at monthly intervals to this account and charged to account No. 668, "Insurance."

132. *Prepaid Directory Expenses.*—Charge to this account the cost of preparing, printing, binding, and delivering directories; also the cost of soliciting advertisements for directories. When directories are issued, this account should be credited each month and operating expense account No. 649, "Directory Expenses," should be charged with the proportion of the cost based on the number of months the directory will be in use.

133. *Other Prepayments.*—When prepayments are made for anything other than as provided for in the four next preceding accounts, the amount of such prepayments should be included in this account.

134. UNEXTINGUISHED DISCOUNT ON CAPITAL STOCK.—If the net of the balances in the discount and premium accounts for all classes of capital stock sold or exchanged is a debit balance, the amount should be stated in this account. (See sec. 6.)

135. UNAMORTIZED DEBT DISCOUNT AND EXPENSE.—If the net of the balances in the discount and premium accounts for all classes of funded debt sold or exchanged is a debit balance, the amount should be stated in this account. (See sec. 7.)

136. OTHER SUSPENSE.—This account should include all debits not provided for elsewhere and the proper final disposition of which is uncertain. It will include all such items as expense of preliminary surveys, plans, investigations, etc., made for determining the feasibility of projects under contempla-

tion. Should any such project later be carried to completion, such amounts should be credited to this account and charged to the proper fixed capital account of accounts; should it be abandoned, such amounts should be charged to Corporate Surplus or Deficit account.

This account should also include the amounts carried in suspense due to extraordinary casualties and unanticipated reconstruction. (See sec. 24.)

When the proper disposition of any item charged to this account is determined, it should be credited to this account and charged to the appropriate account or accounts.

(To be continued.)

Practical Telephony for the Practical Exchange Manager

A Series of Articles Relating to the Construction, Maintenance and Operation of a Moderate Size Telephone Exchange, Which Began in the Issue of September 21, Expressed in Everyday Terms, Easily Understood—Principles Easily Applied

By H. R. Van Deventer

The grave defect in any transmission test is the entire lack of any actual means of measurement. The thermo-galvanometer is the most promising device for absolute measurements, but this cannot measure quality, so after all the ear is the final test. Now what may be "commercial" transmission for one person is not for another. The writer is able to hear very well, speech that is scarcely audible to the untrained listener. At the same time noises which do not disturb the average toll operator, greatly disturb the writer, whose hearing is apparently very sensitive to irregular vibratory sounds. This personal and physiological variation is something which should be clearly kept in mind when investigating transmission tests, and the average results obtained from the report of a number of listeners should be taken.

Some Cable Transmission Comparisons with Open Wire.

To return to the mile of "standard" cable, a type of cable having a commercial transmission limit of 30.5 miles (approximately the same as that of the standard cable), one mile of which is equivalent to: 3.4 miles No. 12 B. W. G. B. B. iron wire circuit (pair); 4.3 miles No. 10 Birmingham wire gage B. B. iron wire circuit; 8 miles No. 14 New British standard wire gage or 12 B. & S. G. hard drawn copper wire circuit; and 13.4 miles No. 12 New British standard wire gage, hard drawn copper wire circuit. Since 3.4 miles of No. 12 B. W. G. B. B. iron circuit is equivalent to one mile of the type cable having a commercial transmission limit of 30.5 miles, the theoretical commercial limit of transmission for this kind of open wire circuit may be assumed as 30.5 times 3.4 miles or 103.7 miles.

This does not take into consideration any loading of the line with telephone instruments. On such a line as the foregoing, the addition of each 1,600-ohm bridged set to the line between terminals, decreases the transmission at least 3 per cent. Each switchboard drop acts in the same proportion. As the ability to ring is nearly always affected much sooner and more seriously by overloading than is the transmission, this matter of overloading reaches its limit before the absolute limit of transmission is reached.

Dealing with the cable alone, from the following data it will be seen that the transmission efficiency of commercial cable is greater or less than the "standard," which is simply an arbitrary sort of foot rule measurement for transmission purposes.

As the efficiency of a cable depends in a great measure upon its electrostatic capacity and conductor resistance, it is necessary to clearly define how these should be measured. There can be little question about the resistance, but the capacity may be measured in two ways, viz.: *grounded* capacity, one wire measured against all the other wires grounded to the sheath; and *mutual* capacity, which is that of one wire of a pair measured against its mate only, the other wires being disregarded. The less the capacity by the grounded test, the better will be the talking quality and the grounded capacity test should always be specified.

The average mutual capacity is always less than the average grounded capacity. For instance, .08 m.f. grounded capacity equals .054 m.f. mutual capacity. Hence it is important to have the method in which the capacity is to be taken, clearly specified.

Types of Lead Covered Cable.

The following is a brief description of some of the standard types of cables.

Type A. A. No. 22 B. & S. gage, single paper insulation, 5 to 500 prs., grounded capacity .105 m.f.; insulation resistance 500 megohms per mile of cable; transmission equivalent to 1.56 miles of standard cable; composition of sheath, 97 per cent. lead, 3 per cent. tin for aerial, lead-antimony for underground, known as Type T. A.

The 10-pr. cable has a ½-in. sheath and weighs .640 lbs. per ft. and the standard reel length is 2,500 feet.

The 50-pr. cable has a ½-in. sheath and weighs 1.319 lbs. per ft. Standard reel contains 2,000 ft.

The 100-pr. cable has a 3/32-in. sheath and weighs 2.120 lbs. per ft. The standard reel holds 1,500 ft.

The 500-pr. cable has a ⅛-in. sheath and weighs 7.360 lbs. per ft., while the standard reel carries 500 ft.

The type B. B. No. 19 B. & S. gage cable with single paper insulation has a grounded capacity of .11[illegible] m.f. and an insulation resistance of 500 megohms per mile of cable; transmission equivalent to 1.14 miles of standard cable; sheath composition same as type A. A.

The 10-pr. cable has a ½-in. sheath and weighs .64 lbs. per ft. A standard reel has 2,500 ft.

The 50-pr. cable has a 3/32-in. sheath; weighs 1.995 lbs. per ft.; reel has 1,500 ft.

The 100-pr. cable has a ⅛-in. sheath; weighs 3.738 lbs. per ft.; reel contains 1,000 ft.

The type H cable for long aerial and underground lines, has conductors of No. 16 B. & S. gage; single paper insulation; grounded capacity of .108 m.f.; insulation 500 megohms per mile of cable.

The 10-pr. cable has ⅛-in. sheath and weighs 1.890 lbs. per ft.; reel has 2,000 ft.

The 25-pr. cable has ⅛-in. sheath and weighs 2.640 lbs. per ft.; reel has 1,200 ft.

The 50-pr. cable has a ⅛-in. sheath and weighs 3.620 lbs. per ft.; reel has 1,000 ft.

The type J cable for very long lines, has No. 13 B. & S. conductors; single paper insulation; grounded capacity of .108 m.f.; insulation 500 megohms per mile of cable; transmission equivalent to 0.567 mile of the standard cable.

The 10-pr. cable has a ⅛-in. sheath and weighs 2.418 lbs. per ft.

The 25-pr. cable has a ⅛-in. sheath and weighs 3.780 lbs. per ft.

There are other standard types of cable, but the types mentioned serve to show the relative thickness of sheath, transmission efficiency and weight per foot.

(To be continued.)

From Factory and Salesroom

Conventions: National Independent Telephone Assn., Chicago, February 18, 19, 20; Minnesota Assn., St. Paul, January 28

Automatic Equipment for Sydney, Australia.

The Automatic Electric Co., Chicago, has just received cable advice from its representative, Automatic Telephones Australasia, Limited, that the Australian government has entered into a contract for the installation of 4,800 lines of automatic equipment in the Newtown, Glebe and Balmain exchanges of the Sydney area. This will be the second installation of automatic apparatus to be made by the Australian government, the first installation having been completed in the Geelong exchange in July, 1912, the operating results of which have proved most satisfactory to both the government and the subscribers.

The conditions to be met by the automatic equipment for the Newtown, Glebe and Balmain exchanges will be the most severe test that can be imposed upon it, as the entire Sydney area consists of 27 branch exchanges, having over 20,000 lines in service. These exchanges are all interconnected by means of a very complex trunking system, and, after the three automatic exchanges have been installed, it will be necessary to give service between them and the remaining manual exchanges.

It is understood that it is the intention of the Australian government to change over all of the remaining manual exchanges in the Sydney district as soon as conditions will permit.

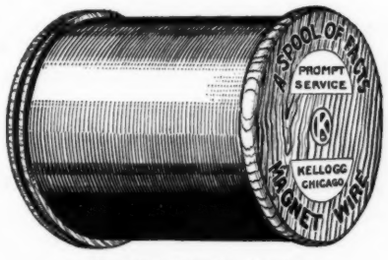
A Booklet on Wire.

If you are in any way interested in magnet wire, either silk or enamel insulated, you will profit by mailing a card to the Kellogg Switchboard & Supply Co., Chicago, asking to be put on its magnet wire mailing list, as this firm has just issued a series of novel and forceful advertising matter that is really valuable in the technical information given.

As all buyers know, magnet wire comes in spools and the Kellogg company has carried out this idea by compiling "Spools of Facts," 12 of them, each one taking up one phase of the magnet wire subject.

These "spools" are printed on heavy clearstock in three colors to indicate the yellow wooden spool ends, the glossy black of the enamel insulated wire and the green of the silk covered wire. Each "spool" is therefore an exact reproduction, enclosure size, and is cut in the shape of the real article.

On the inside, as stated, is presented a chapter on magnet wire service and quality. Some of these titles, to indicate their nature, are: "Spool of Facts in Baking," "On Enameling," "On Prompt Shipments," "On Equipment."



A Booklet Worth Having.

In addition to these "spools" the Kellogg company is distributing an attractive folder technically describing its magnet wire in an exceedingly interesting manner.

The subject of magnet wire is so new that few of us have any conception of the difficulty in the production of good wire and of the good points of service that do not appear on the surface of the wire which is wound on the spool.

Copies of the "spools" series will be sent out monthly. It will pay you to have your name on the Kellogg list.

Dean Salesmen Hold Big Meeting.

The sixth annual sales meeting of the Dean Electric Co., was recently held at Elyria, Ohio, the company's entire force of salesmen being called to the factory for that purpose.

There were many unique features on the program, the cover of which is here shown, and the salesmen attended every meeting faithfully, being in session every night until 10:30 or 11 o'clock.

Program Cover of Dean Sales Meeting.

At this meeting a splendid gold watch was presented the president of the company, Mr. Bean, as a token of the loyalty and esteem of the staff The presentation was made by H. J. Booth, a well-known attorney, who made a strong address. Mr. Bean, while somewhat overcome, responded fittingly. At the same meeting George A. Scoville, sales manager, was presented with a silver coffee set.

On one afternoon a reception was held at Mr. Scoville's home. Mrs. Scoville and Mrs. Ray H. Manson entertaining. The sales force responded by inviting every one present to be their guests at dinner, and a banquet followed that evening. There the ladies were called upon for toasts and responded cleverly. On another evening, at the Elyria Country Club, the salesmen presented the ladies with a mammoth vase of American Beauty roses.

The banquet given earlier in the week was the largest of its kind ever held in Elyria, and every salesman was there.

It was unanimously agreed that that was the most successful of its kind the Dean Electric Co. had ever had, and the spirit shown is declared to easily explain why the Dean company doubled its business for 1912 over that of 1911.

Century Closes Canadian Contract.

The Century Telephone Construction Co., of Buffalo, N. Y., through its Canadian branch, has just been awarded the order

for a two-position, 200-line magneto switchboard by the Welland County Telephone Co., of Bridgeburg, Ontario. This board will be of the latest improved type and is to be used as an addition to the Ridgeway exchange to take care of the rapid growth experienced by the Welland company in that territory.

The numerous orders being received by the Century company indicate the high esteem in which that company's products are held in the Canadian district. Advance reports all point toward an exceedingly good business this coming year.

Standard Underground Co.'s New Canadian Branches.

The Standard Underground Cable Co. of Canada, limited, has established new branch offices at Montreal and Winnipeg in order to facilitate the prompt handling of their growing business.

The Montreal office will handle all business from the province of Quebec and the eastern part of the province of Ontario. This office is in charge of R. G. Harris, formerly connected with the general offices of the Standard Underground Cable Co., Pittsburgh, Pa., but more recently with the New York sales offices of that company.

The Winnipeg office will handle all business coming from the provinces of Alberta, Saskatchewan, Manitoba and a portion of the province of Ontario lying west of Ft. William. B. S. Stewart has charge of this office. Mr. Stewart has been for some time in the central office of the associate American company, Pittsburgh, Pa., later going to the Chicago sales office of that company, where he has been located for a number of years.

The general offices of the company at Hamilton, Ont., will handle all business from the central and northern portions of the province of Ontario. W. H. Marsh, sales manager and secretary of the company, has direct charge of the business coming into this office, as well as general supervision of the various branch offices.

Business originating in the province of British Columbia and Alaska and Yukon territories will be handled by the Seattle, Wash., office of the company, and business from the Maritime provinces will be handled by the Boston, Mass., office. This is a temporary arrangement in order to secure prompt service immediately for customers in those districts, until the volume of business justifies the establishing of separate offices in the Dominion.

The establishment of these branch offices places the Standard Underground Cable Co., of Canada, Ltd., in an excellent position to handle, with accuracy and dispatch, all business which it may secure. The men in charge of the various offices are salesmen of experience and ability, released by the associate American company in order to strengthen the personnel of the Canadian company.

A Popular Desk Set Bracket.

The No. 710 desk set brackets manufactured by the Century Telephone Construction Co., of Buffalo, N. Y., are coming into greater prominence. Telephone users are more and more realizing the convenience and adaptability of this bracket in connection with their desk telephone. The bracket is furnished with either a single or double sweep and can accommodate one or two telephones. It also is adapted for mounting on roll top, flat top or standing desk, table, window casings or wall. Its adjustable claw fits the base of any make of desk stand. It is furnished in oxidized copper or nickel plate. Illustrations and full descriptions can be had by writing direct to the Century company.

Ericsson, Harry and Felix.

Whenever Harry Dyer or Felix Shwab takes an Ericsson telephone under his arm and goes "up the river" the natives all rush out and implore him to take their orders for immediate delivery. Even those fearsome, deep-dyed villains, the "moon-shiners," creep from their dark and dismal lairs, it is alleged, and steal softly up, to beg the boon of the only telephone that can hear an Internal Revenue officer on tip toes, in his stocking feet, two hundred miles away.

And speaking of immediate delivery—of course said natives couldn't get it and Harry and Felix couldn't give it were it not for the fact that the Southern Electrical Co. is right in Nashville, Tenn., and that's where our heroes live. Likewise, none of these things could be true if the Southern Electrical Co. didn't carry a nice big stock of the wonderful Ericsson stuff—telephones, of course,—right in Nashville all the time. And naturally the aforesaid fearsome and sundry other kinds of natives are those who ply their calling in Tennessee—and they're not all moon-shiners. Lots of them are just regular telephone men—even as you and we (editorially speaking).

Paragraphs.

THE DOUBLE-PHONE MFG. CO., of Boston, Mass., has moved to more capacious and modern quarters, the new address being 309 Washington street. The company reports the sales of its product as increasing daily.

THE H. B. CAMP CO., The Rookery, Chicago, is mailing out an attractive reminder that "Now is the time to decide what kind of vitrified clay conduit you will use in the spring." On the card, which is printed in colors, is a representation of men digging a trench in which to install the Camp duct.

ED STOEFFHAUS, of the Rebuilt Equipment Co. of Chicago, announces that Bulletin No. 5 is now ready for distriibution. The bulletin lists a number of bargains in apparatus, such as common and local battery telephones, either desk or wall types, switchboard parts, telephone parts, operator's chairs, etc. A copy will be sent on request.

THE JULIUS ANDRAE & SONS CO., of Milwaukee, which announces the appearance of its new telephone catalog, is a pioneer in the telephone line. As the catalog is most complete, illustrated and priced, it is believed it should form a valuable basis of comparison and set a standard of quality for telephone apparatus and supplies. The company states that it constitutes a reference book which every telephone company should have on file.

THE CENTURY TELEPHONE CONSTRUCTION CO., of Buffalo, N. Y., Reports a brisk business during December. In fact, orders for the No. 90 all-metal desk type telephone have been so numerous that it has kept the company hustling to keep up with the demand. This desk telephone, it is stated, has met with much favor among telephone managers, and all accord it great praise. The Century company will be glad to explain the advantages of this instrument to any interested person and invites correspondence on the subject.

Telephone Men in the A. I. E. E.

The January issue of the Proceedings of the American Institute of Electrical Engineers contains the names of the following members, who have recently been transferred to the grade of Fellow: H. F. Albright, general superintendent, Western Electric Co., New York; Bancroft Gherardi, engineer of plant, American Telephone & Telegraph Co., New York; and F. B. Jewett, assistant chief engineer, Western Electric Co., New York.

The following associate members have been transferred to the grade of member: John Mills, engineering department, American Telephone & Telegraph Co., New York, and H. S. Webb, principal, schools of telephony and telegraphy, International Correspondence School, Scranton, Pa.

The following have been elected associates: B. L. Dolbear, telephone engineer, New England Telephone & Telegraph Co., Boston, Mass.; G. O. Taylor, traveling toll wire chief, Southern Bell Telephone & Telegraph Co., Atlanta, Ga.; and C. W. Whitman, telephone and signal engineer, Providence, R. I.